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PC WORLD

SEPTEMBER 1996

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TOP 10 Printers TOP 10 Monitors

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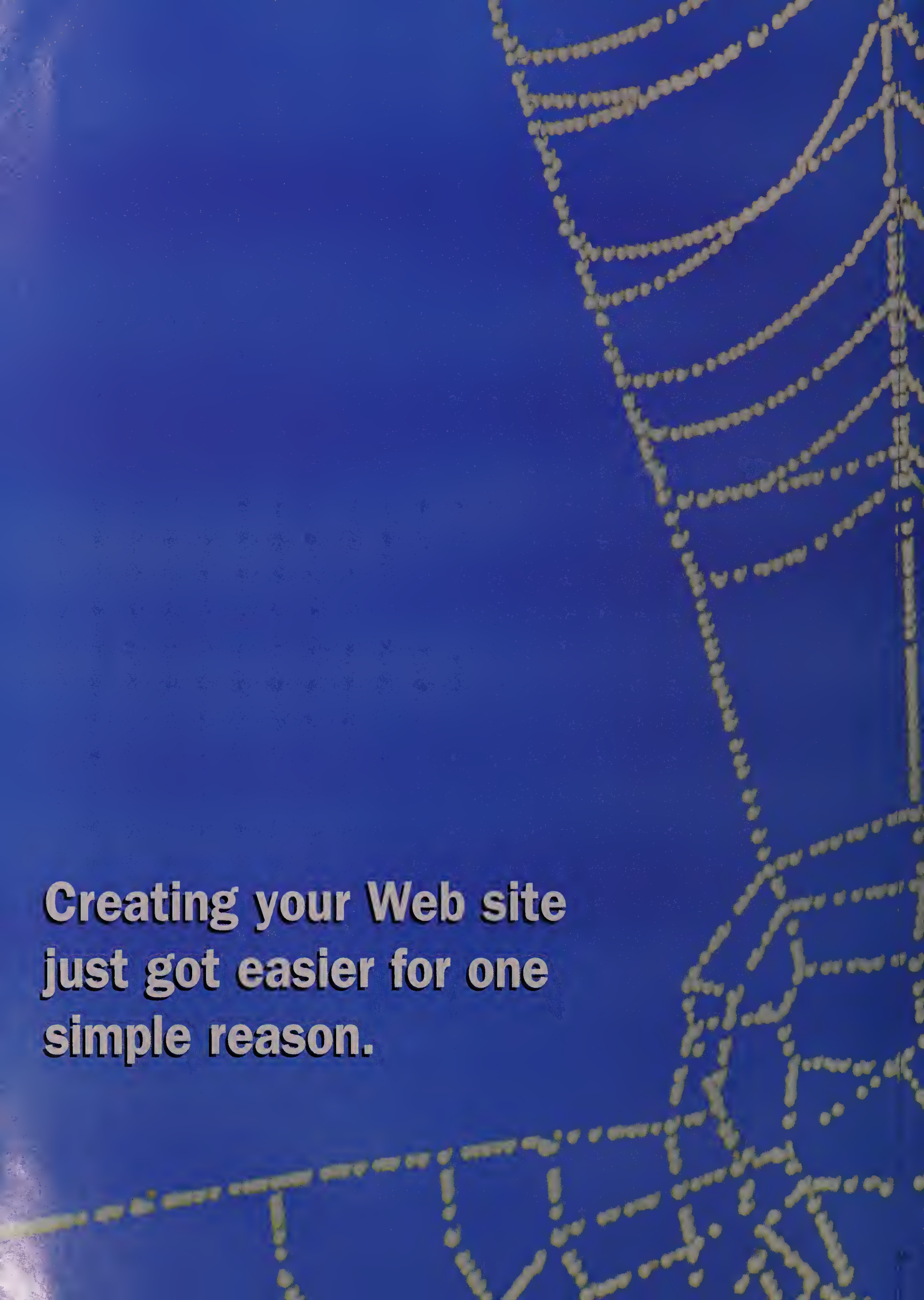
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PC WORLD

SEPTEMBER

VOLUME 14 ◆ NUMBER 9 ◆ MULTIMEDIA EDITION

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109 CD-ROM DRIVES: BEHIND THE RATINGS

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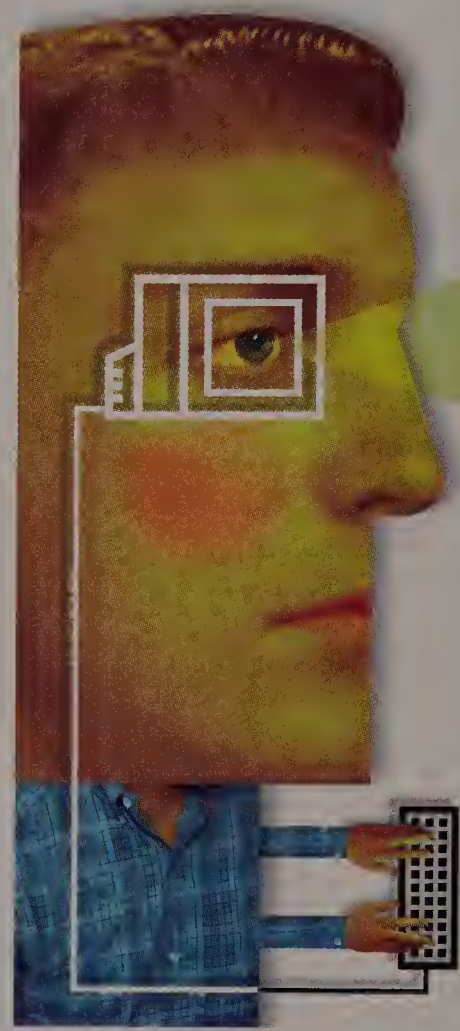

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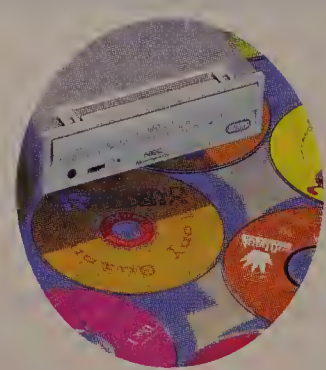

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COVER *Photography by Stan Musilek*

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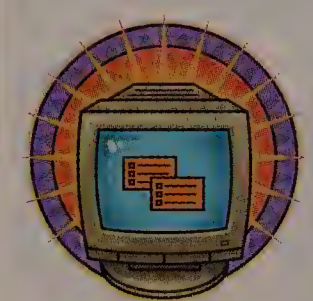

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TOP 100

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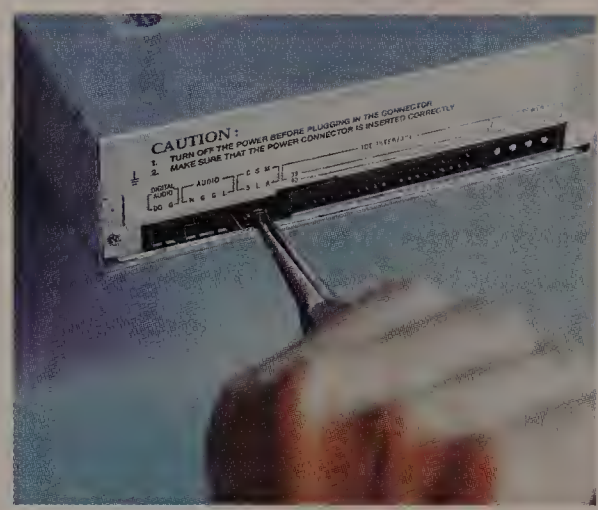

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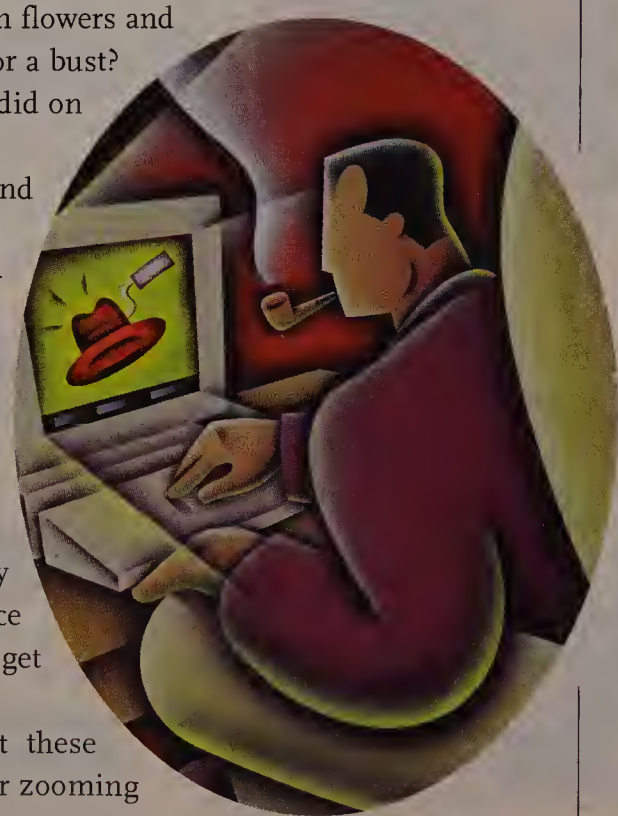

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ONLINE SERVICES We review new versions of the two leaders. Are they easier to use with features borrowed from browsers?
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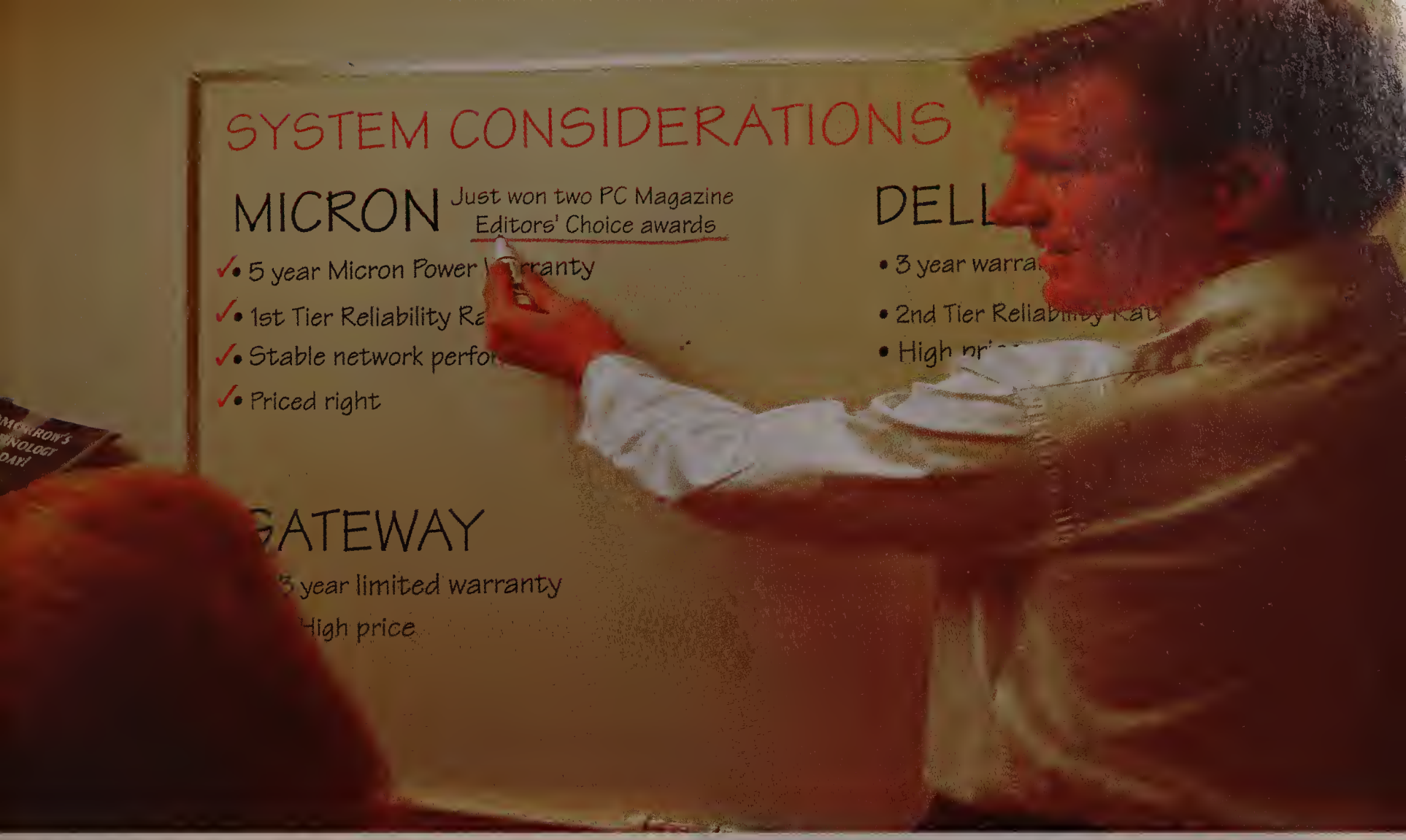

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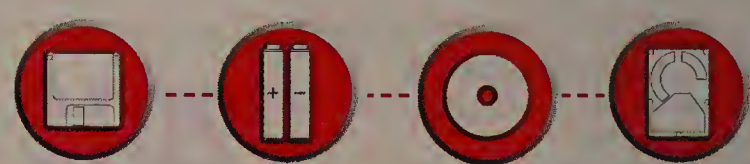

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AUGUST 1996
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† 6.9 lbs. includes 3.5" floppy and one battery
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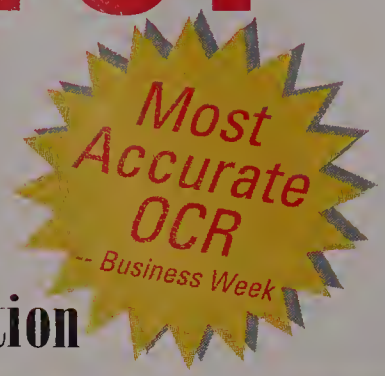

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There are other ways to accelerate your multimedia, but may we suggest our new Graphics Blaster.

Multimedia can be a frustrating thing. Even on today's hottest systems, video playback can end up looking like a postage stamp with fewer colors than you get from a box of crayons. Or, when you zoom it to full screen, it looks like a slide show instead of a smoothly running movie. Before you resort to extremes, you might want to try our new Graphics Blaster™ multimedia accelerator from Creative Labs.

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Are You Being Served?

EARLIER THIS YEAR, our editors spent a couple of weeks with *PC World* readers, asking what they liked and disliked about the magazine. We talked to a cross section of people, from those running businesses in home offices to MIS professionals in large corporations. We learned a lot from this group, but two themes came across especially loud and clear: First, readers need to find information faster, and they think computer magazines put too many hurdles in their way. Second, too many readers question the editorial objectivity of computer magazines, including *PC World*, and suspect that advertisers influence editorial content and product recommendations.

The second criticism surprised us. Unlike other computer magazines, *PC World* regularly publishes investigative consumer stories—on mail-order scams, misleading product specifications, used PCs and re–shrink-wrapped software, subpar service practices—in addition to publishing monthly consumer columns as a service to readers. We routinely factor reliability and service ratings into our evaluation of new PCs. We conduct rigorous, repeatable tests on all manner of computer products in our independent Test Center. We insist that editors and writers follow a standard journalistic code of ethics to avoid conflicts of interest. Still, though the suspicion of *PC World*'s editorial collusion with advertisers is completely unfounded, it calls for action on our part.

Though **suspicion** of PC World's editorial **collusion** with advertisers is unfounded, it **calls for action.**

With this issue of *PC World*, we introduce a number of changes designed to address both concerns. Here's a quick rundown of some of these changes, from the first page to the last:

Table of contents. An expanded, three-page table of contents will help you find information more easily and quickly. On the contents pages and throughout the magazine, look for the icon used to designate related content on PC World Online (http://www.pcworld.com), such as expanded reviews and daily news.

Consumer Watch. Moved from our @Home section to the front of the magazine, *Consumer Watch* continues its long-standing tradition of taking the consumer's side and now addresses the needs of both business and home buyers. Here Contributing Editor Roberta Furger will alert you to important trends, offer straightforward buying advice, and, when warranted, take companies or the industry to task for shoddy performance or questionable practices.

PCW Advocate. Also moved to the front of the magazine, this column (formerly known as *Feedback*) goes to bat for readers by attempting to resolve their service-related problems with companies. Written by Assistant Editor Aoife McEvoy, *PCW Advocate* will also let you know which companies earn readers' accolades for outstanding customer service.

Bugs and Fixes. Moved from *Top of the News* (where it was called *Bug Watch*) and expanded to a full page, this column tracks hardware and software bugs and incompatibilities. Contributing Editor Scott Spanbauer also points you to fixes—software patches, updated drivers, and work-arounds when necessary.

The Top 100. This new section includes revamped versions of *PC World*'s monthly Top 20 and Top 10 reviews. For more information about all the changes in the Top 100 and the complementary coverage on PC World Online, turn to pages 196–197.

@Home. This expanded section will include regular columns—*@Home Products, Keeping Up,* and *Top 5 Home PCs*—and feature stories like this month's "Is Shopping on the Internet Worth It Yet?" which examines the pros and cons of Internet shopping. Here you'll also find Contributing Editor Steve Bass's column, *Home Office,* relocated from its position on the last page.

Here's How. Now leading off this section is *Real Problem, Real Solution,* a first-person report from a manager whose company has used PC hardware or software to solve a business problem. *Answer Line,* formerly *Help Line,* responds to your hardware and software questions. Along with the other Here's How columns, two new columns appear this month. *Multimedia Tips* will help you troubleshoot problems with CD-ROMs, CD-ROM drives, and other multimedia products. *Upgrade Guide* is a one-page photographic guide to performing hardware and software upgrades yourself.

Full Disclosure. Writer Stephen Manes's column moves to the last page of the magazine. This month Manes takes on the thinly veiled marketing ploy known as product registration.

All these changes—and more that you'll see as you read this issue—are designed to help you find the information you need more quickly and to remind you that *PC World*'s recommendations are independent and objective.

Our thanks go to award-winning designer Don Morris and his design studio and to *PC World* Art Director Robert Kanes and our art department for the magazine's superb new design. We hope you'll like what you find. Let us know what you think. ■

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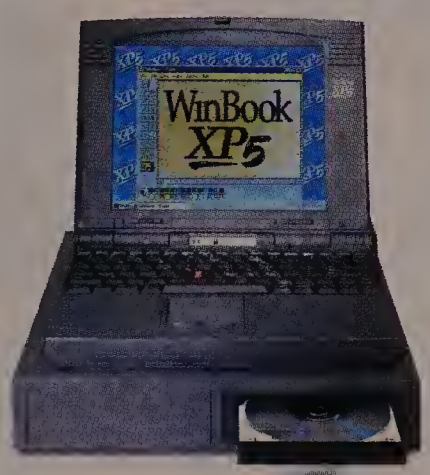

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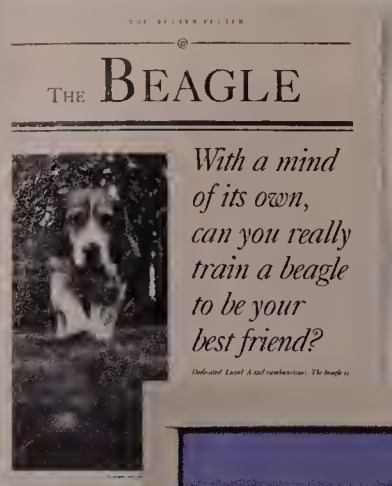

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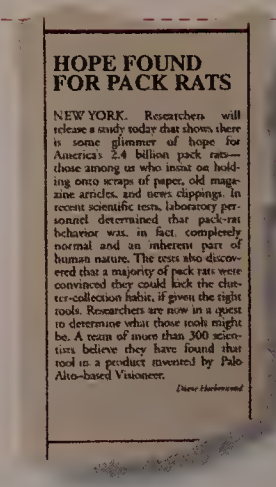

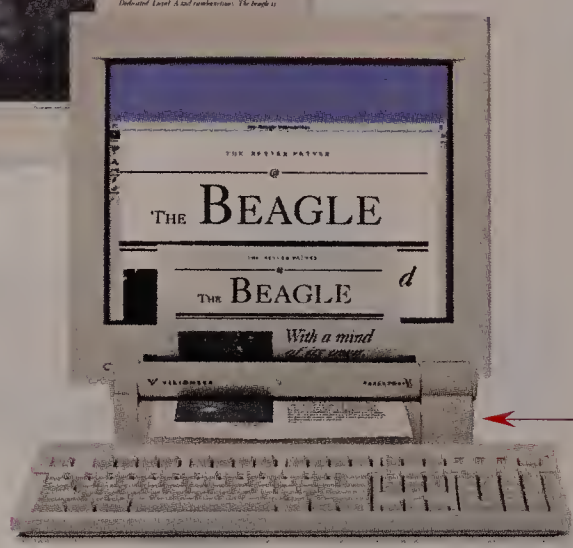

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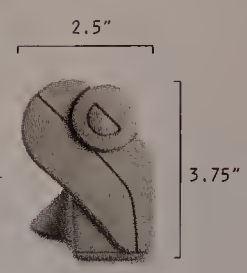

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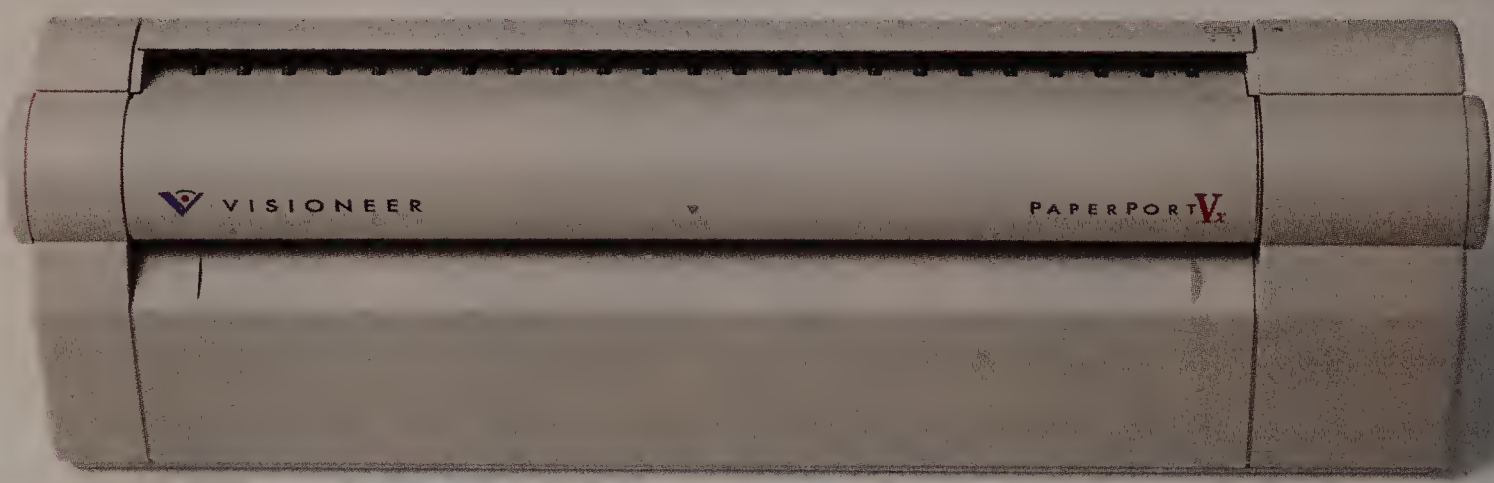

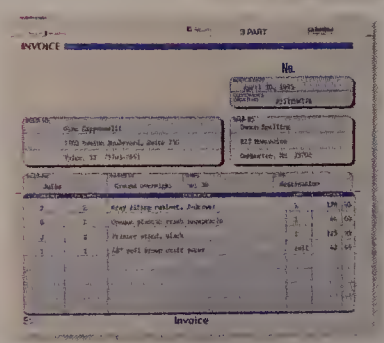

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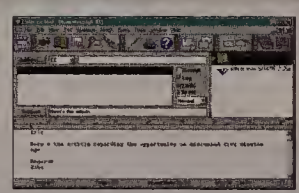

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Circle 187 on reader service card

YOUR TAKE ON: Alleged RAM fraud ◆ World Class winners and losers ◆ ISP shopping

SCAMS SCARING BUSINESS AWAY

THANK YOU FOR the article "RAM Scam!" in your July edition. Considering all the money that is put into computers every day, scams like those alleged in the article are very harmful to the entire industry and breed paranoia toward respectable companies. I hope the computer industry does not become like some other industries in which the motto is, "Screw everyone else over to make a buck." I myself almost bought RAM from several such companies, but because of your article, I won't.

Jason Meinzer, Kailua, Hawaii

I WAS SHOCKED and at the same time quite happy to read your article about alleged RAM fraud.

Such scams are terrible for people who do legitimate business online and by mail order. As a consultant and reseller I have done a wide range of business coast to coast, but I doubt that very many shoppers will do business with small mail-order

companies after reading "RAM Scam!" Still, even though it will scare away some business, I am very pleased with your reporting. Great story!

Gregg Daly, Salinas, California

OS/2 HOPELESS? HARDLY

IN "BEST PRODUCTS OF 1996" [July], your sidebar "Is It World Class Yet?" included this little comment: "Last year, what did our panel of experts crown as product of the year? IBM's OS/2 Warp, a product so hopelessly doomed..."

Where do you see OS/2 as hopeless or doomed? IBM has a loyal user base (steadily growing, with a string of million-sale months, according to the company's John Thompson), loyal independent software vendors and shareware authors, incredible performance, great stability, multitasking, the works.

I'd hardly say that OS/2 Warp is hopeless. In light of the impressive roster of companies that rely on OS/2's dependable multitasking, I would hardly say that it's doomed either. Statements such as yours are way out of line. Please watch them in the future. I'll believe it when IBM itself says, "Further development of OS/2 has permanently ceased."

Eric McCann, Mt. Plymouth, Florida

TAKING THE GUESSWORK OUT OF CHOOSING AN ISP

I THINK THAT "The No-Nonsense Guide to Internet Providers" [July] was written with me in mind. Its thoroughness and information were superb! It all but took the guesswork out of picking an Internet service provider. I now know where to look, who to call, and the right questions to ask. Thank you for a great article and a great magazine. I just renewed my subscription.

Judy DeVos, Mission, Texas

MICROSOFT NETWORK'S METAMORPHOSIS

I JUST READ your article on Internet service providers. When you listed major national online services, you did not include the Microsoft Network. I'm new to this field of technology; is there something that does not qualify it?

Ken Linn, Microsoft Network

Author's response: Microsoft Network is listed as an Internet service provider rather than as an online service. At the time we worked on the article, the service was in transition. It was neither a commercial online service nor an ISP, but it was moving in the direction of becoming an ISP—and currently it is more of a Web-based content provider than anything else. —Yael Li-Ron ▶

CROSS FIRE

Win 95 Should Have Won World Class

REGARDING "BEST PRODUCTS OF 1996" [July]: As a new Netscape Navigator user and a satisfied Windows 95 customer since last August, I was somewhat amused by your panel's conclusion that Navigator is Product of the Year and Win 95 both runner-up and Loser of the Year.

By and large, Windows 95 was very low in number of bugs and high in reliability. Given all the hype, the fact that cynics could not find more to gripe about shows something about the product's quality. And while Navigator has done much to further the Internet, such development was bound to happen anyway. Surely your experts can't ignore all the 32-bit software that Windows 95 has caused to be developed worldwide.

Product of the Year? Sorry, you panel of experts. My vote goes to Windows 95.

Keith Murray, Wichita, Kansas

It's a Loser, and So Is the Press

WHEN READERS VOTED Windows 95 as Loser of the Year, the editors of *PC World* should have graciously stepped to the podium to accept the award on Billy Gates's behalf. It was your magazine, and so many like it, that abandoned journalism and greedily misrepresented the truth. It isn't 32-bit, it isn't preemptive multitasking; the significance of Win 95 is as a face-lift for Windows.

Don't blame Microsoft: You had the beta code in your hands. Recognize your role and accept responsibility. You were losers as journalists and industry analysts. Read your own words: "Everyone we spoke to who pinned 'loser' on Windows 95 complained about Microsoft's big buildup." Forget Microsoft; it's supposed to promote its products. You're supposed to sort out the truth about them.

Jim Clancy, Atlanta

JAMES YANG

COMING UP
IN OCTOBER

TECH SUPPORT ONLINE
Get It Good (and Free)
Free tech support used to be just a phone call away. Vendors still provide no-cost support online, but Web sites are often unresponsive. Here's a guide to online tech support—where to go and how to find what you need.

MULTIFUNCTION DEVICES
Jacks of All Trades
They're printers, fax machines, copiers, and scanners. But integration in multifunction devices comes with compromises. We review the latest from Canon, HP, Sharp, and Xerox.

SOFTWARE SUITES
Suite Tips and Tricks
Application suites should provide efficient, integrated ways to get your work done with a word processor, spreadsheet, database, and more. What are the best ways for it all to work together? We uncover the best tips for Microsoft Office, Lotus SmartSuite, and Corel WordPerfect Office.

NEW TECHNOLOGY
Internet PCs for the Home
Net appliances are coming, from set-top boxes to modem-equipped TVs.

ALSO NEXT MONTH

▶ **The PC World Top 100:** The most current buyers' guide to hardware. Check out the Top 20 Power Desktops, Budget Desktops, and Notebooks; plus the Top 10 Personal Printers, 15-inch Monitors, Graphics Boards, and Modems.

▶ **Special Report on the Web and Workgroups:** Our latest top workgroup and enterprise servers. Plus a look at intranet apps and tools.

PC WORLD

SOLD ON PC WORLD ONLINE

JUST GOT DONE USING your Web site for the first time. I am very impressed with both the layout and functionality of the pages. It took me only a few minutes (at 14.4 kbps, no less!) to find the reviews and product comparisons I was looking for. After reading the articles, I called a manufacturer at the phone number listed, and a short conversation later was sold on the purchase of a SyQuest EZ135 that's just ducky.

Thanks for providing all the resources I needed in one place—it made my research that much easier.

Chris Chorney, Meriden, Connecticut

HOW IRONIC THAT, after blowing the lid off of fee-based hardware technical support, *PC World*'s own online edition now requires a subscription.

David E. Carr, Tewksbury, Massachusetts

Editor's response: PC World Online does not require a subscription; our content is free on all the major commercial online services, and the vast majority of it also is free on the World Wide Web (http://www.pcworld.com). But certain premium services on the Web site do require a subscription. We charge a small monthly fee for certain special services: interactive buying guides, extra shareware, some audio content, and so on. We also offer steep discounts in online subscription fees for those who already subscribe to the print magazine. **–Russell Glitman**

SURVIVING A HARD DISK CRASH

SORRY TO READ ABOUT Steve Bass's bad luck ["When My Backup Crashed," *Home Office*, July]. I have a Conner Tape-Stor 800 and have used it twice in the last three months to restore my hard drive. The first time it helped me recover from corrupted files, and the second time it saved me from a virus, after which I wound up having to format my hard drive twice. I was (and am) so thankful for that tape backup, it's now just about a daily procedure. The Conner is probably the best investment I've made.

Michael Burgess, Cumming, Georgia

HERE'S THE BEST METHOD for testing a tape backup: Restore part of the tape. Select three large files, from the beginning, the middle, and the end of the tape. Move or rename the original files on the hard disk, and then selectively restore these three files. Use DOS's comp command to make sure the restored copy is the same as the original. Open and examine a restored document or spreadsheet file. I strongly recommend doing this test once every few months.

I've had two tape drives malfunction without indicating errors. I caught the problem both times with this method.

Jed Rothwell, Internet

STAMP OUT UNSOLICITED FAXES

I WAS A BIT concerned when I read your Small Office/Home Office special report [July]. In "You Sleep, Your Office Doesn't," you state, "Come midnight, it automatically broadcasts marketing solicitation faxes to prospective clients..."

This statement implies that you may be faxing to clients who have requested information (a legal activity) or to prospective clients with whom you have had no contact (cold contacts, an illegal activity). A federal law outlaws unsolicited faxing of marketing, sales, or other information to prospects who have not specifically requested this information.

Thank you for an excellent publication. This one omission is small but I feel an obligation to set the record straight.

David Fant, President, Market MappingPlus, Wyoming, Michigan ▶

CORRECTIONS AND CLARIFICATIONS

Our July news story "RAM Scam!" discussed a memory broker in San Diego named West Coast Micro, which changed its name in 1993 to Pacific Coast Micro. This company is in no way related to West Coast Micro Inc., a memory distributor in Costa Mesa, California. *PC World* has no record of reader complaints against the Costa Mesa company and regrets any confusion that the name similarity may have caused.

The PC WorldBench score for the Dell Dimension P100t appeared incorrectly in the July and August Top 5 Home PCs charts. The correct score is 173.

PC World regrets the errors.

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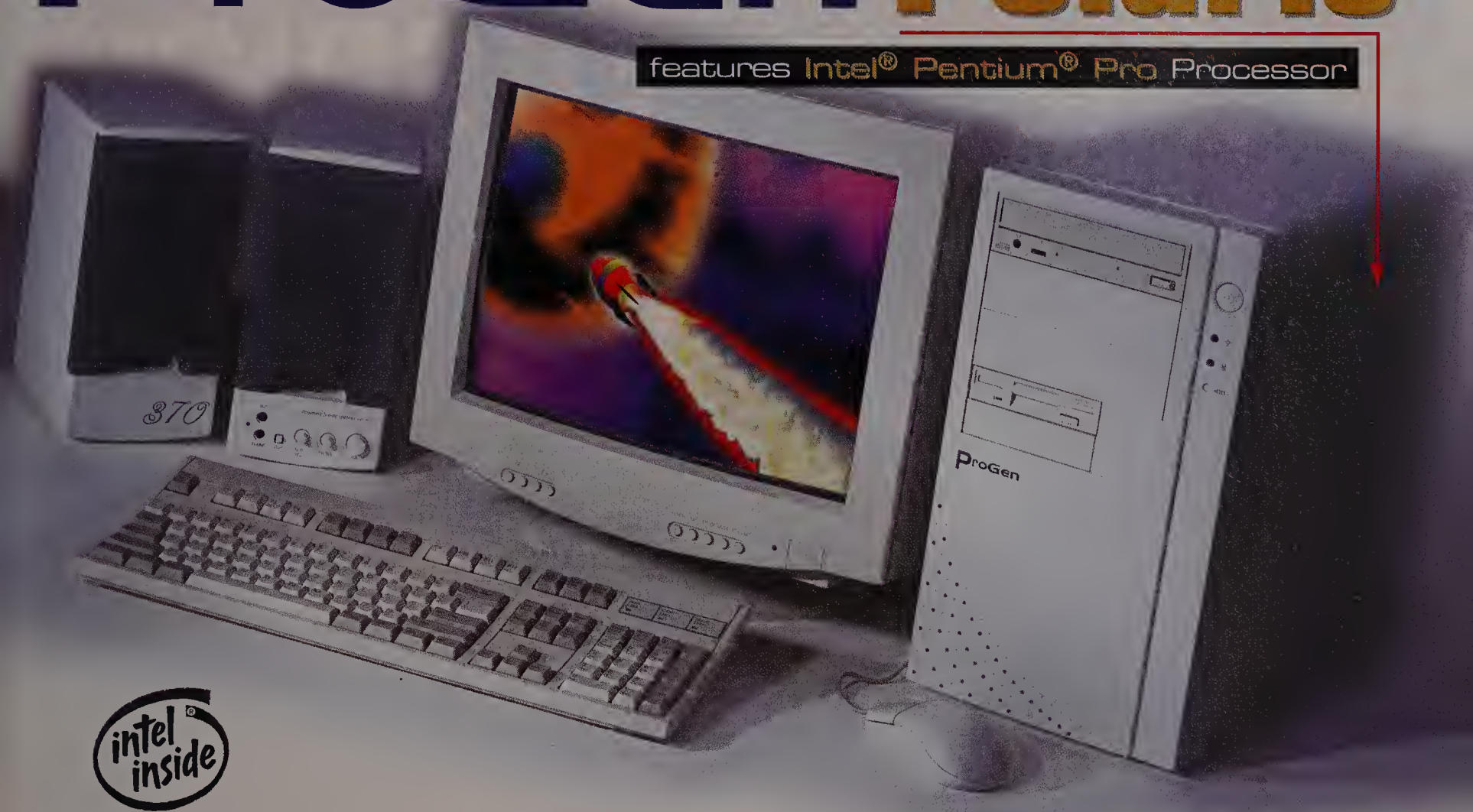

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Circle 184 on reader service card

Display

Increased Productivity
1995
1994
1993
Projections
Sales
ViewSonic Growth
1995
1994
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ViewSonic 15GA	15"/14.0"	0.27mm	1,280 x 1,024	Yes	Yes	$499
ViewSonic 17GS	17"/16.0"	0.27mm	1,280 x 1,024	Yes	Yes	$699
ViewSonic 17GA	17"/16.0"	0.27mm	1,280 x 1,024	Yes	Yes	$799
ViewSonic GT770	17"/15.9"	0.25mm*	1,280 x 1,024	Yes		$899
ViewSonic 20G	20"/18.4"	0.28mm	1,600 x 1,280		Yes	$1,299
ViewSonic GT800	20"/19.1"	0.30mm*	1,600 x 1,280	Yes		$1,899
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ViewSonic 17GA April 1996

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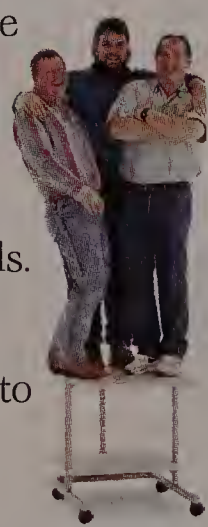

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THE PRICE OF LOW RELIABILITY

YOUR METHOD OF SCORING computers seems fair for your monthly ratings of Top 20 PCs. However, your readers should be aware of the relationship between price and reliability. I bought a WinBook XP notebook that eventually showed up in your Top 20. It did not score very high for reliability, but the price was attractive. I have since sent it back to the factory four times for repairs.

Having to pay for shipping has added nearly $250 to the cost of the computer. The company has offered to sell me an extended warranty for an additional $300. Consequently, when I see a low reliability figure in your ratings, I add $750 to the list price to include shipping, extended warranty, and a contingency amount for pain and suffering.

John P. Kavchar, Santa Cruz, California

PUMPED UP AND LOSING GROUND

REGARDING "COREL PUMPS UP WordPerfect Suite for Win 95" [June]: Corel pumped it up so much that it takes WordPerfect 7 about twice as long to load on my machine as Microsoft Word 7.0. WordPerfect, which used to be the standard for PC word processing, lost ground by releasing a 32-bit version almost a year after the arrival of Windows 95.

Sure, the suite includes many bonus applications. But bigger isn't always better. At the core of the suite is WordPerfect 7, which unfortunately is slow to load and close and has a user interface that's too busy. I installed it, checked it out, and uninstalled it, all within an hour. Then I sent it back to Corel for a refund.

Christopher Brown, Kalaheo, Hawaii

Editor's note: Like you, we found WordPerfect 7 to be disappointingly slow, in addition to encountering other shortcomings in the Corel WordPerfect Suite. But we did find pluses, including a great price and, as you mention, lots of extra applications. Check out our feature story, "Software Suites: Corel Takes on Microsoft and Lotus" in this issue, and decide for yourself. ■

PC World *welcomes your responses, ideas, and other letters to the editor.* *See page 12 for contact information.*

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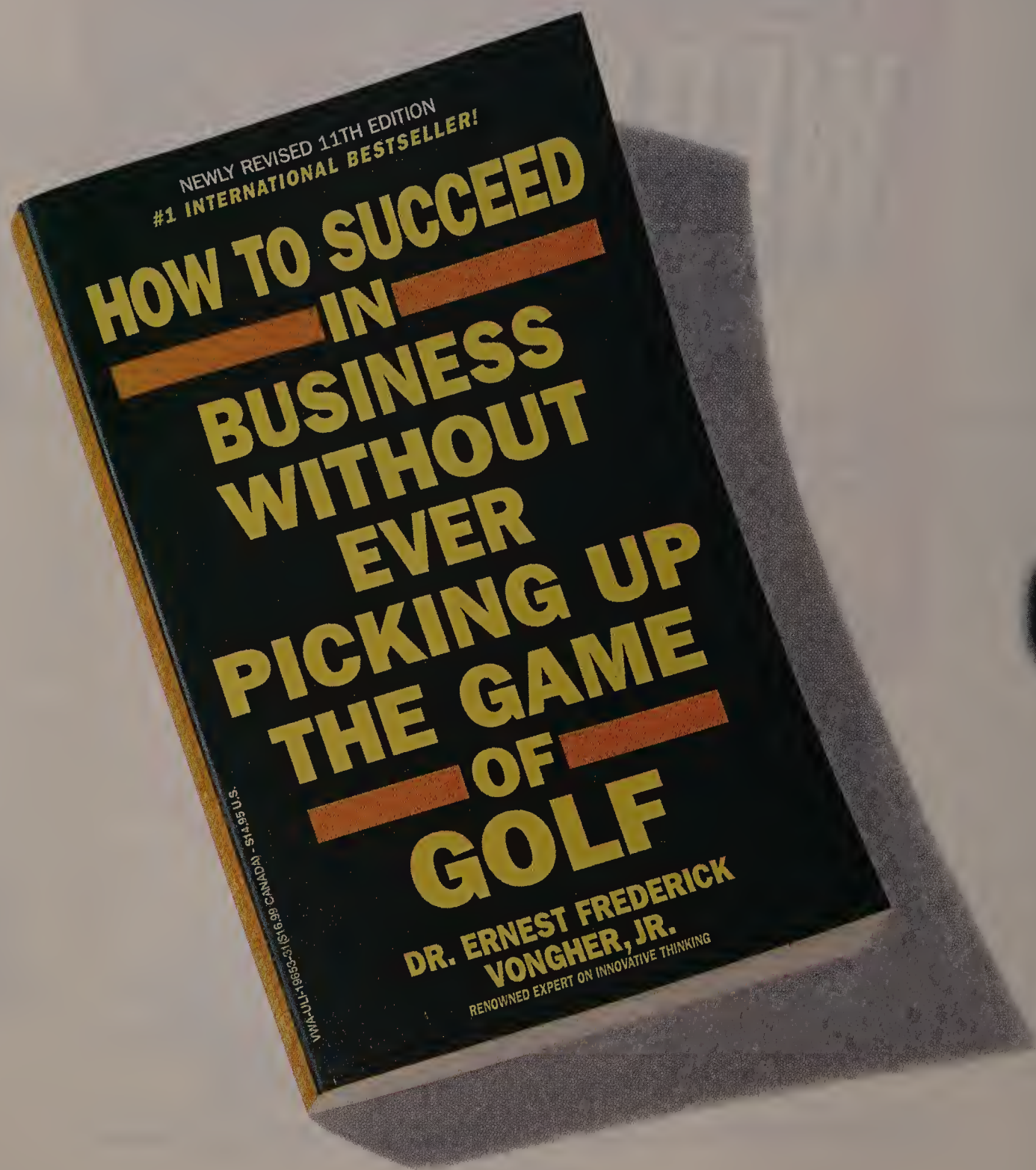

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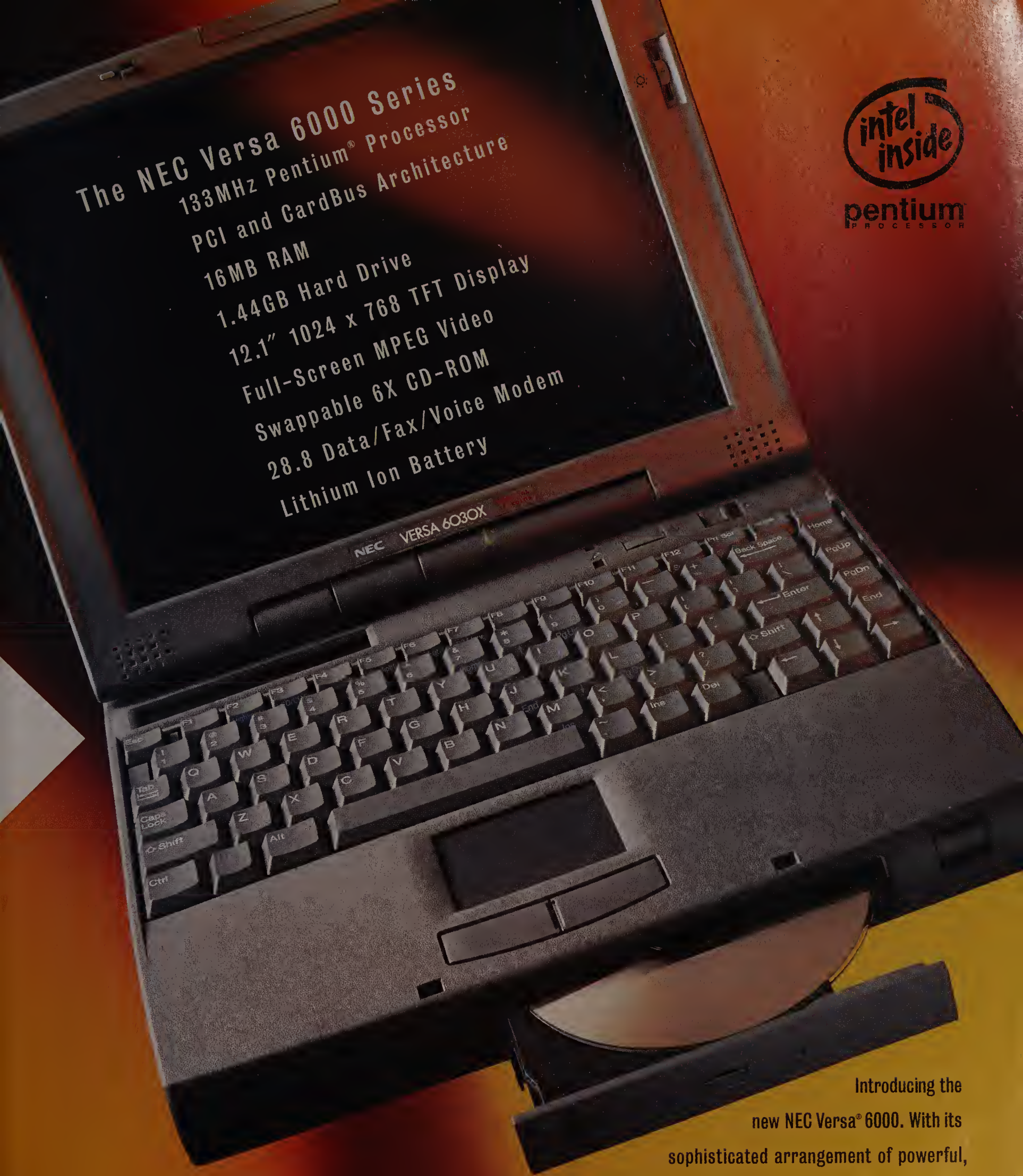

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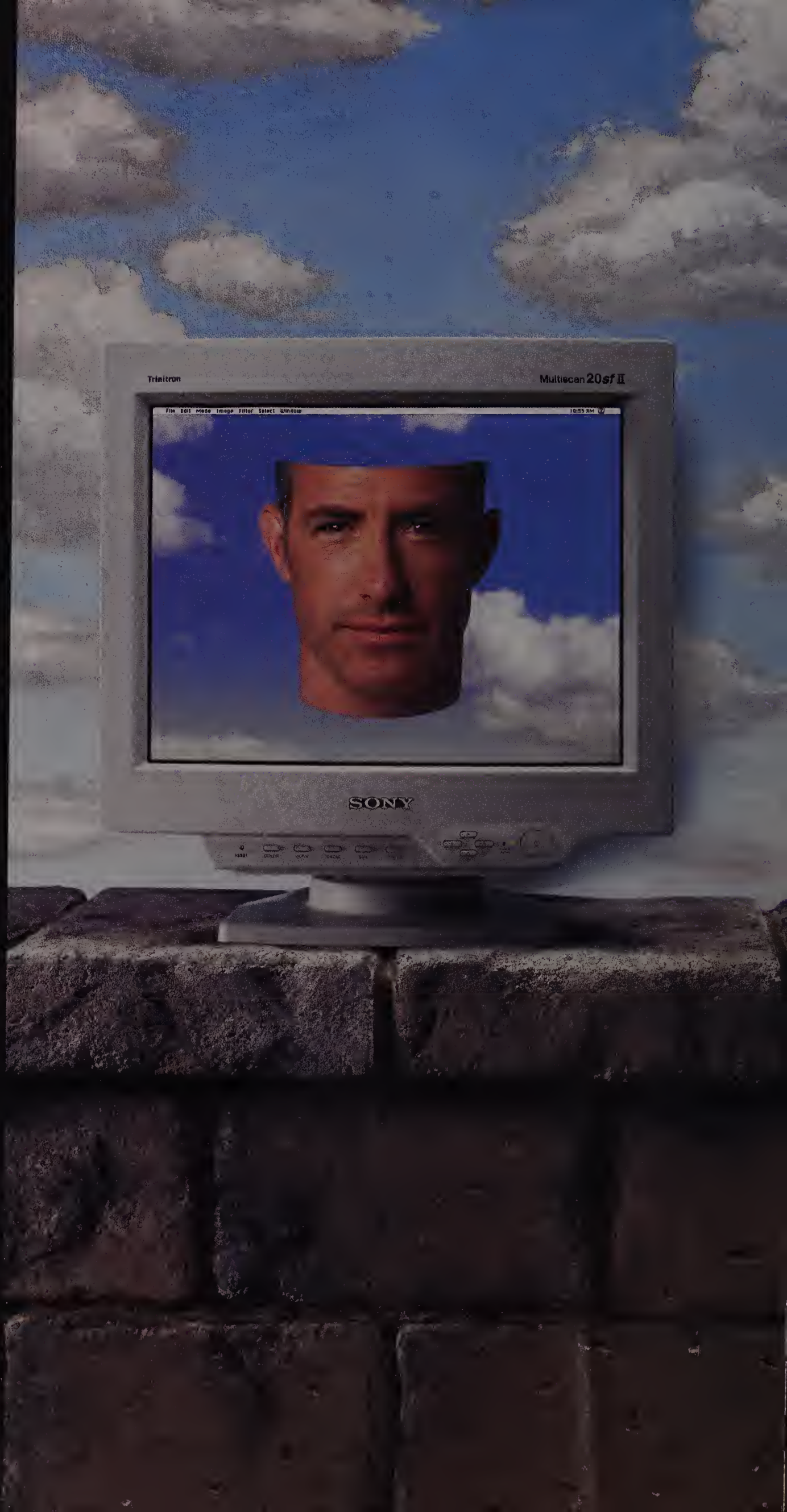

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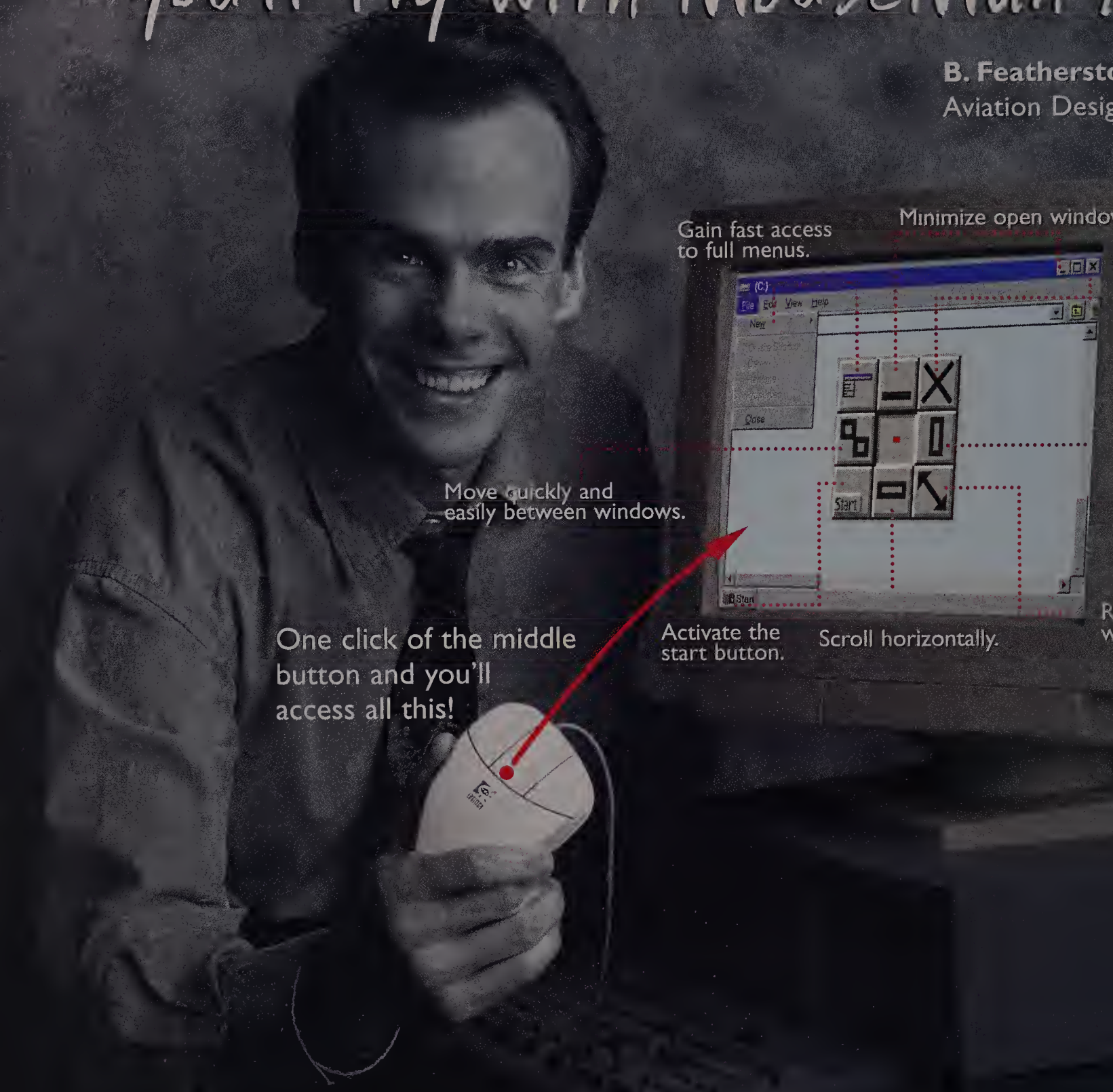

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PC Warranties: Look Before You Leap

Knowing your coverage before you need it will save you some last-minute hassles.

ROBERT CARDIN

YOUR PC'S WARRANTY provides you with valuable information in small type about when and how its manufacturer will carry out all the wonderful policies that its advertisements display in large type. But when was the last time you read your PC warranty?

If you're like me, you probably don't give it more than a passing glance—until your computer starts giving you trouble. By then, it's probably too late. By then you're probably in panic mode, so discovering that the warranty doesn't cover everything you thought it did can only further distress you.

The whole concept of warranties is to give you the perception of security and convenience. For example, the current trend in PC warranties is to offer "on-site" service. But depending on how the warranty is written, you could wind up swapping out your own hard drive instead of having a technician come to your home or office to do it for you. Although many companies tout three-year warranties, not all three-year warranties are created equal. Some vendors really do pay for both parts and labor in the second and third years, while others limit second- and third-year coverage to replacement parts alone—it's up to you to install the parts or pay someone else to do it.

IT'S THE DETAILS THAT MATTER

ALAS, YOU WOULDN'T DISCOVER any of these differences (lawyers call them caveats) just by flipping through ads in *PC World* or other magazines. To assess how well you'll really be taken care of in time of need, you have to go to the source: the warranty itself. There, amidst the legal mumbo jumbo and 6-point type, you'll find the details on how product returns, repairs, tech support, and other services will be handled.

Some of the minutiae you turn up might surprise you. Here's just a sampling of what I discovered when I took out my magnifying glass and studied the warranties of some of the leading PC companies:

◆ Dell's warranties do not cover sound cards or speakers. Similarly, some nonstandard components are not covered under a Dell system warranty—even if you had them installed at the time you bought your PC. Instead, they are covered under warranties issued by the components' manufacturers.

◆ Dell and Gateway both offer three-year warranties. But on some systems, unless you pay extra up front, Gateway's and Dell's second and third years of coverage pay only for replacement parts—not for the technician to install them. Austin's multiyear warranty, on the other hand, covers parts and labor.

◆ *You* don't get to decide when you need on-site service—even when you pay extra for it. For example, for an extra fee, Micron will provide on-site service for its Home MPC systems. But Micron's warranty makes clear who's in the driver's seat when it comes to dispatching a technician. It reads, "To arrange for on-site service you must call Micron...and our representatives will, *if Micron elects to provide on-site service* ▶

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[emphasis added], make arrangements with such third party to provide service to you." And this proviso pretty much reflects standard operating procedure for most warranties.

◆ On-site service varies depending on where you live. Most PC companies stipulate that on-site service is available only to customers located within a specific geographic area. Typically, this condition is worded in terms of the customer's proximity to one of the company's authorized dealers or repair centers. Compaq, for example, provides on-site service only within 60 miles of a service center. Acer will drive a little farther: It provides on-site service for customers located within 100 miles of one of its service centers. But it tacks an additional 24 hours onto the guaranteed response time for customers whose home or office is more than 50 miles from the nearest Acer service center.

◆ Most companies reserve the right to replace defective parts still under warranty with previously used components that have been "factory reconditioned." But the length of time those parts are covered under warranty varies by manufacturer. Gateway covers replacement parts for 30 days, Micron for 90 days.

◆ NEC requires customers to show or send a receipt before receiving warranty service. Compaq uses what it calls its Warranty Verification System to determine eligibility. Just provide the PC's serial number, and Compaq or one of its authorized service centers can verify coverage.

> You should get your **hands on** as many warranties as possible before you **make a decision** about which computer to buy.

GETTING THE HARD COPY

IF I'VE CONVINCED YOU that reading the warranty prior to purchase makes sense (and it does), then the only thing left is to get your hands on as many warranties as possible before deciding which PC to buy. Fortunately, that's fairly easy to do. Thanks to the proliferation of World Wide Web sites, I was able to download detailed warranty and technical support information for Acer, Compaq, Dell, Digital, Gateway 2000, Micron Electronics, and NEC Technologies. (Among the other major PC companies, AST, Austin, Hewlett-Packard, and IBM all have Web sites chock-full of product information, but I found only one line at each site about the corresponding warranty coverage.)

Another possible source of warranty information is a company's fax-back service. Simply dial a toll-free number from a touch-tone phone, select the information you're looking for from a voice-mail menu, and then punch in your fax number and wait for the document to be sent. The systems are automated, so you can call day or night. As with some Web pages, though, you may get only the barest details about the warranty.

You can also check out warranties at retail stores, which are required by law to have the warranties for all products they sell available. The warranties are typically stored in big binders in the customer service department, so you can flip through and find the information for the products you're interested in. Check to make sure the warranty covers the specific model you're considering, since policies can vary markedly among a PC maker's multiple product lines.

But stores don't necessarily update the binders every time they start selling a new line, so the information can easily be out of date. For example, I went to Circuit City looking for the warranty on an IBM Aptiva, but all I found was the document for the discontinued PS/1. If you can't find the information you need, ask the salesperson to pull a warranty from one of the boxes. You may get a funny look, but you'll see the document. One more bit of advice: Ask for copies of the warranties to take with you, particularly if you're trying to compare coverage of multiple PCs.

WHYS AND WHEREFORES

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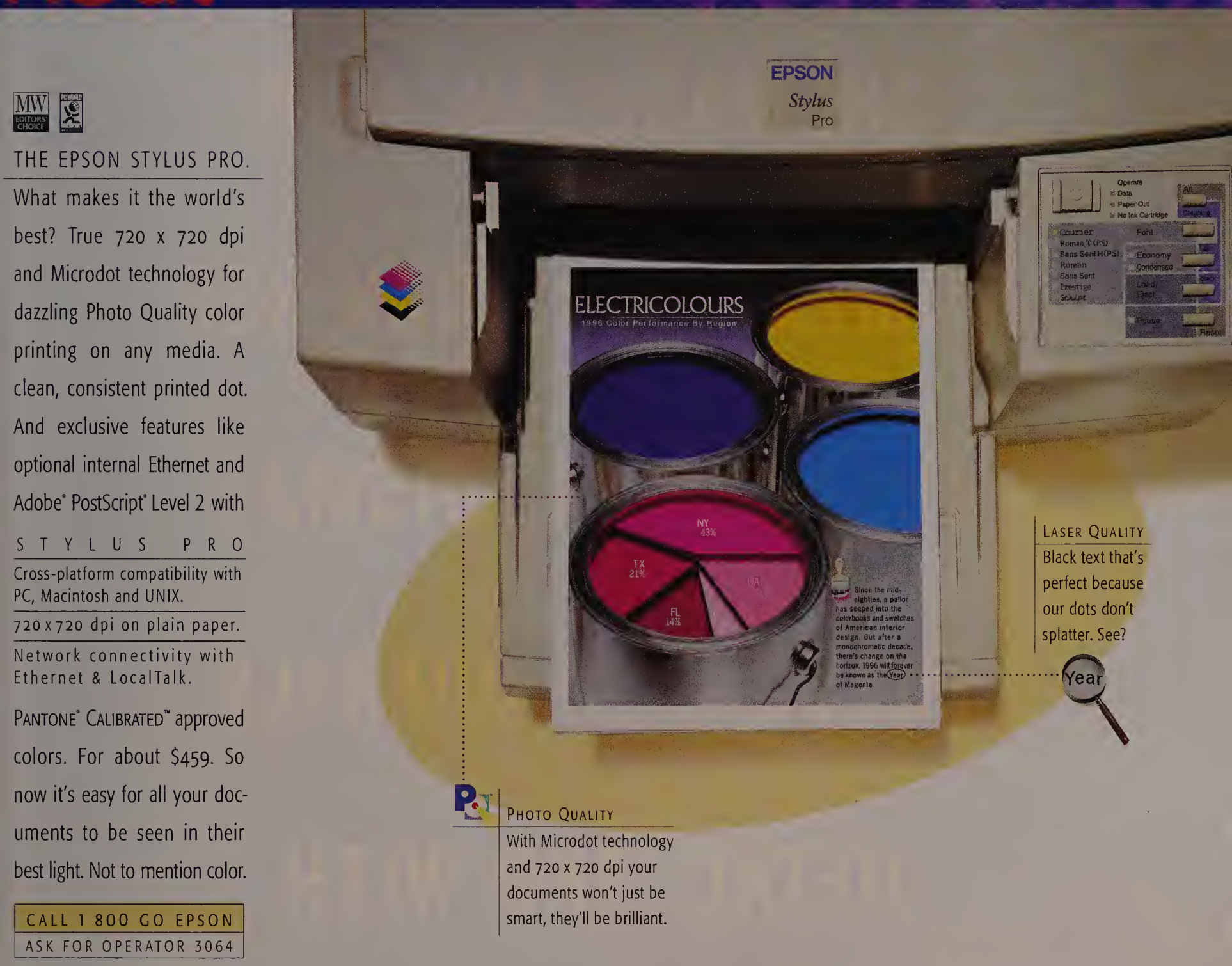

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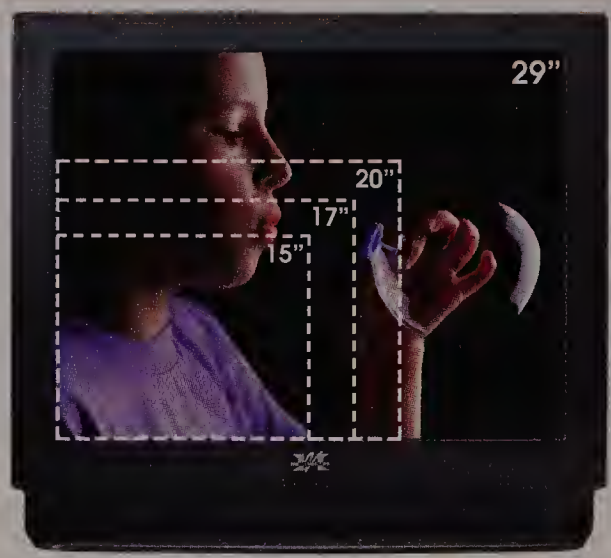

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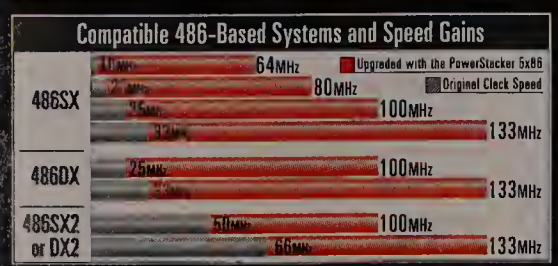

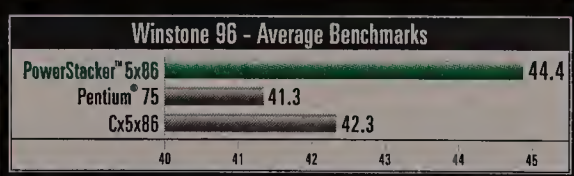

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Circle 238 on reader service card

won additional service in extraordinary circumstances the warranty ordinarily would not cover. But who wants to fight? Not me. I'd much rather spend a little time up front researching a purchase than a lot of time later on regretting it. ■

Have you ever been caught off guard by the fine print in your computer's warranty? Send me your comments on warranties or any other topic you'd like to see covered in an upcoming Consumer Watch column at consumerwatch@pcworld.com.

KNOW YOUR RIGHTS

What to look for in a PC warranty.

- **Exclusions:** Are any components not covered under the standard warranty?
- **Limitations:** Does the company specify conditions under which coverage applies? For example, when will it dispatch an on-site technician? Some companies limit on-site service to specific components; others offer it only to customers in a specific geographic area.
- **Length of coverage:** How long is the system under warranty? If it's a multiyear warranty, check to see if you're entitled to on-site service after the first year (a rarity) and whether the additional years cover both parts and labor.
- **Voiding the warranty:** Does installing your own components or memory nullify your coverage?
- **Technical support:** Just about every company offers toll-free technical support. Check on the hours of operation and whether it's *free of charge*. Free software support is likely limited to installation questions. With a few notable exceptions, hardware support should still be free. If you don't see the information in the warranty, ask. Don't assume it's free.
- **Replacement parts:** Does the company reserve the right to replace defective parts with refurbished or reconditioned ones? While reconditioned parts may function as well as new components, you should know if that's what you're getting. You can ask that only new parts be used—though the company's not obligated to comply with your request.

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the first time you got

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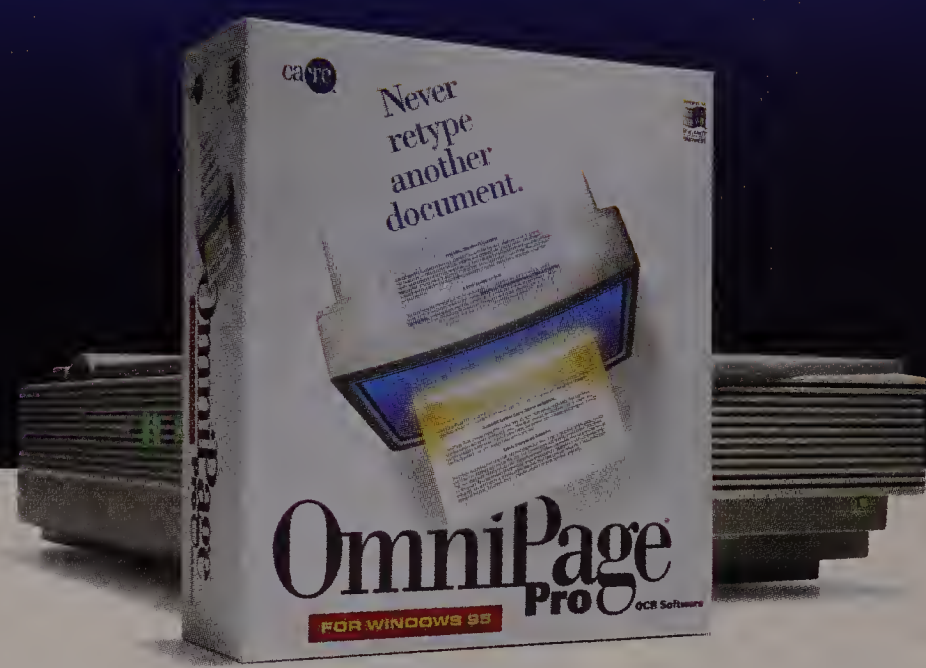

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> *PC Computing—December 1995*

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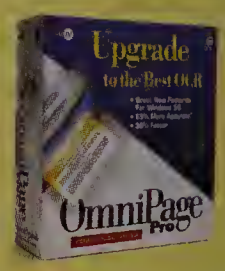

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Circle 91 on reader service card

Getting out of Sprynet trials ◆ Hard drive warranties ◆ Quantex service improves

ISP Accounts: Difficult to Cancel?

SAYING NO TO SERVICES

I ACCEPTED SPRYNET'S offer of a free trial. I liked the company's Internet service, but my family bugged me about the bill, so I stopped using it. However, I can't figure out how to quit. I believe Sprynet is a division of CompuServe, but how do I discontinue the service?

Kenneth McDade, Washington, Pennsylvania

Editor's response: It was a mystery to many readers how to cancel their accounts. We spoke to John Irwin, Sprynet's public relations specialist, who assured us he canceled McDade's account when he stopped using the service. At press time, McDade reports he is hopeful the credit will appear on his next statement. Sprynet is owned by Spry, CompuServe's separate Internet division. Irwin suggests going to Customer Care on the Sprynet home page (http://www.sprynet.com) if you have questions about the service. You have three options for canceling a Sprynet account: Call 206/957-8997; fax a cancellation note to 206/957-6000; or send an e-mail message to cancel@spry.com or service@spry.com. Remember to include your full name, address, and e-mail address to speed up cancellation.

WHO HANDLES MY WARRANTY?

I PURCHASED an Acer system with a 1.2GB Seagate hard drive from Data Techniques in Richmond, Virginia. Eight months later the computer crashed, so I sent it to a local repair shop. The technician there told me that the problem lay with the hard drive. But Data Techniques has gone out of business, and I'm wondering how I can get the replacement drive that my warranty says I'm entitled to. I've tried contacting Seagate, but to no avail.

George B. Walkey, Myrtle Beach, South Carolina

Editor's response: We received several letters about Seagate hard drive problems. We contacted Seagate to try to find out what Walkey's options were. Woody Monroy, corporate communications manager, told us many consumers are confused about who handles hard drive warranties. It depends on whether you bought a Seagate hard drive kit off the shelf or got the drive preinstalled in a computer. In the first situation, Seagate handles the warranty; in the second, the dealer or system manufacturer does. Normally, Seagate would have told Walkey to contact Acer. But Monroy discovered that Walkey's retailer had assembled various components in an Acer box, so Seagate sent Walkey a replacement drive.

Our advice? Be careful when you buy a bargain computer. If a retailer has cobbled together a system from parts on hand, you could encounter hassles when it comes to resolving warranty issues.

BETTER SERVICE ALL AROUND ONE YEAR LATER

I BOUGHT A PC from Quantex Microsystems in October 1994, and in the process I became miffed with the company. First, I had difficulty getting through to the sales department, both to place my order and to follow up on it. Then, after the system arrived, I had trouble getting through to Quantex's tech support. Recently I received approval to purchase a computer for work, and I wanted the most bang for my buck. Extensive research indicated that the best machine was a Quantex. I hesitated initially, but in the end I ordered one.

What a difference a year makes! The sales line was answered immediately. And for follow-up questions, I was able to reach my salesperson directly at his own toll-free number. Because of some Windows 95 problems, I had to call technical support on four separate occasions—also on a toll-free number. Each of those calls was answered by a technician within 30 seconds. Quantex has sure improved the way it does business, and I'm impressed.

Peter Belmas, Reno, Nevada ■

Think you've gotten a raw deal—or a great one? PCW Advocate *wants to hear the details at advocate@pcworld.com. We'll investigate complaints and publish items of the broadest interest. Aoife McEvoy is an assistant editor for* PC World.

THE FINE PRINT

Is 30-Day Money-Back Always a Guarantee?

The ad seems impressive. But watch out for hidden costs. Fine print in a Maximus ad for PCs in Computer Shopper held surprises about the 30-day money-back guarantee.

1. You have to pay return shipping and the original freight if you decide to send the system back within 30 days.

2. The 30-day period starts on the date the system is shipped to you, so your evaluation period may be less than 30 days.

3. The money-back guarantee applies only to advertised systems. If you add memory or request any modification, you void the guarantee. Without it, you may be liable for a 20 percent restocking fee.

Be sure to have your list of questions ready and a copy of the ad with you when you call to place any PC order.

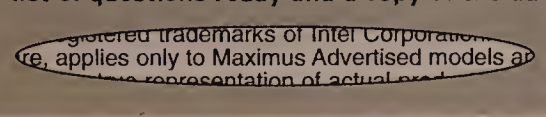

ILLUSTRATION: ROBERT NEUBECKER, ICON: JEFFREY PELO

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Now, whether you're looking for the ultimate in performance, flexibility or economy, there's a Compaq® notebook that's just right for you.

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For even more flexibility, try a notebook from our new Armada 4100 line. It will transform from a super-portable slimline notebook (with a Pentium processor up to 133MHz) to a multimedia notebook with its optional, and detachable, Mobile CD Unit. And it can hold up to three lithium ion batteries — one of which can function as a handy carrying handle.

And the new Armada 1100 family lets you hit the road with a 100MHz Pentium processor, at an incredibly affordable price. With Compaq, the choice is yours. (So is the call.)

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WHICH ONE'S FOR YOU?

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Standard Memory	16MB	8MB	8MB
Memory Expandable to	80MB	40MB	24MB
Hard Drive	1.35GB Removable/ Multiple Drive Support	810MB	810MB
Battery	Enhanced NiMH	Lithium Ion	Enhanced NiMH
Cache	256K L2	256K L2	N/A
Video Graphics	32-Bit PCI Local Bus	32-Bit PCI Local Bus	32-Bit PCI Local Bus
IR Support	Yes	Yes	No
Pointing Device	EasyPoint™ II	Touchpad Optical Trackball (optional)	Optical Trackball
Display (others available)	11.3" CTFT SVGA	11.3" CSTN SVGA	10.4" CSTN
Other Features	• Intelligent Manageability • 16-Bit Stereo Sound and joystick/MIDI port • MVA and Optional Hardware-Based MPEG • Optional MultiBay Expansion Base with/ without ISA Slot • Optional 6X CD-ROM Drive	• Flexible 3-in-1 design • 4 User-Programmable keys • Integrated Audio and NTSC/PAL Support, and Zoom Video • MPEG-1 (software-based) • Optional Mobile CD Unit with 4X CD-ROM Drive, Speakers, 16-Bit Stereo Sound and joystick/MIDI port • Optional Convenience Base with/without Ethernet	• Tilting, Full-Function Keyboard • Detachable handle
Software Preinstalled	Choice of Windows® 95 or Windows 3.1	Windows 95	Windows 95, Astound, CSE, and MS-Works®
Weight	7.2 - 7.5 lbs. depending on model	5.1 - 8.2 lbs. depending on configuration	6.1 lbs.
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Today's Internet is a superhighway, taking you to places you've never dreamed of. But to travel it in style, you need the right vehicle. The new 17PX monitor from Hansol. This 17-inch (15.7" viewable) masterpiece features a 0.26mm dot pitch black matrix CRT with anti-static and AR coating, plus 1600 x 1200 ultra-high resolution. For clarity, color, and depth that makes you feel you're looking out a window, not at a screen. While its rapid refresh rate keeps you steady, its advanced menu controls provide 20 on-screen settings to keep you in complete command. It's also fully PC and Mac compatible, with no adapter needed, and comes with a 3-year limited warranty.

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Circle 102 on reader service card

Speed Enhancements, Security Improvements

Netscape Navigator 2.02

BUG As we reported in the June column, Netscape's Navigator 2.0 Web browser passed along to the end user serious security flaws in the Java programming language. Netscape's Navigator 2.01 update plugged some, but not all of these holes, according to Princeton University researchers Drew Dean, Ed Felton, and Dan Wallach.

WORK-AROUND Netscape says Navigator 2.02 (http://home.netscape.com/comprod/mirror/client_download.html) addresses potential security holes. Nevertheless, Princeton's Java-jammin' research trio says version 2.02 is still open to attack from Java applets, which theoretically may damage your system. Dean, Felton, and Wallach (http://www.cs.princeton.edu/sip/) recommend disabling Navigator's Java support. To do this choose *Options•Network Preferences•Language*, and uncheck the *Enable Java* and *Enable JavaScript* options.

A Faster, Better Microsoft Exchange

IF YOU USE WINDOWS 95's Exchange e-mail program, you know how long it takes to load. Microsoft has released an updated version, renamed Windows Messaging, that loads faster, integrates features formerly available only through add-ons, and fixes bugs.

Microsoft says the Windows Messaging update also performs better on 8MB systems and incorporates two add-ons formerly available separately: One module lets it access Microsoft Mail shared folders, and the other supports Internet e-mail. Download the 3MB self-extracting archive file from Microsoft's Web site (http://www.microsoft.com/windows/software/exupd.htm).

Microsoft has also posted new versions of its Exchange Server Client for Windows 95, NT, and 3.1 and DOS. Though Exchange Server is a LAN e-mail and group scheduling application aimed primarily at Windows NT–based corporate workgroups, the new Exchange Server Client offers stand-alone users everything they'll find in the Windows Messaging update, and a little more.

Besides supporting existing Exchange Server features such as shared folders, forms, and directory synchronization, the filled-out upgrade adds signatures—a standard e-mail feature still missing from Windows Messaging. The client software also comes with an enhanced copy of Microsoft's Schedule+ personal information manager, which can import data from a wide range of third-party PIMs and PDAs including Act for Windows 1.1 and 2.0, Lotus Organizer 1.0 and 1.1, Ecco, PackRat 4.1, and Sharp and HP organizers. Incredibly, you still can't transfer data between Exchange and Schedule+ address books.

You can download the Exchange/Schedule+ bundle in a single file or in several parts from http://www.ms-exchange.com/download.htm. Note: the two files total over 9MB and can take more than an hour to download with a 28.8-kbps connection.

New Windows 95 Password Cache Fix

BUG You downloaded and installed the Windows 95 Service Pack 1, and suddenly your Dial-Up Networking Internet connection no longer saves your password. What gives? Ironically, the problem rests with the Service Pack's fix for Windows 95's anemic original password encryption (reported in *Bug Watch*, March). If a program like Dial-Up Networking tries to remove a password from the cache file, a larger section of the file may become corrupted. This event trashes any passwords stored there and prevents further password caching in the corrupted area.

FIX You'll find a new password caching patch on Microsoft's Windows 95 Web site (http://www.microsoft.com/windows/software/passwd.htm). This patch retains the more aggressive encryption from the Service Pack fix, but doesn't toast your cache file.

BUGGED?

FOUND A HARDWARE or software bug? Post your report on PC World Online, or send us e-mail at bugsandfixes@pcworld.com.

IN BRIEF

U.S. Robotics WinModem 33.6 Upgrade

U.S. Robotics has posted two files that upgrade its WinModem from 28.8 to 33.6 kbps. You can find wm336upg.exe and winm336.exe on http://www.usr.com/home/2055.html.

Micron BIOS and Digital Video Upgrades

Micron recently released an updated BIOS for its Millennia Transport notebooks that fixes two separate problems: dropped characters when data is transferred through the serial port or modem, and the screen flashing on intermittently in suspend mode under Windows 3.1. You can find bios4011.exe on http://www.mei.micron.com/services/bbs/transport.htm.

Update: Symantec FTP Server on the Move

Since pointers to patches for pcAnywhere32 and WinFax Pro appeared in the July column, Symantec rearranged its FTP site. Find pcAnywhere's 70up_a.exe patch at ftp://ftp.symantec.com/public/updates/win95nt/pca; the WinFax Pro 7.02 patch at ftp://ftp.symantec.com/public/updates/win95nt/winfax/v70.

ICON: JEFFREY PELO

{See How Business Travels}

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100MHz Intel Pentium® processor and EDO RAM all built on 32-bit PCI bus architecture provide outstanding performance

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intel inside pentium PROCESSOR

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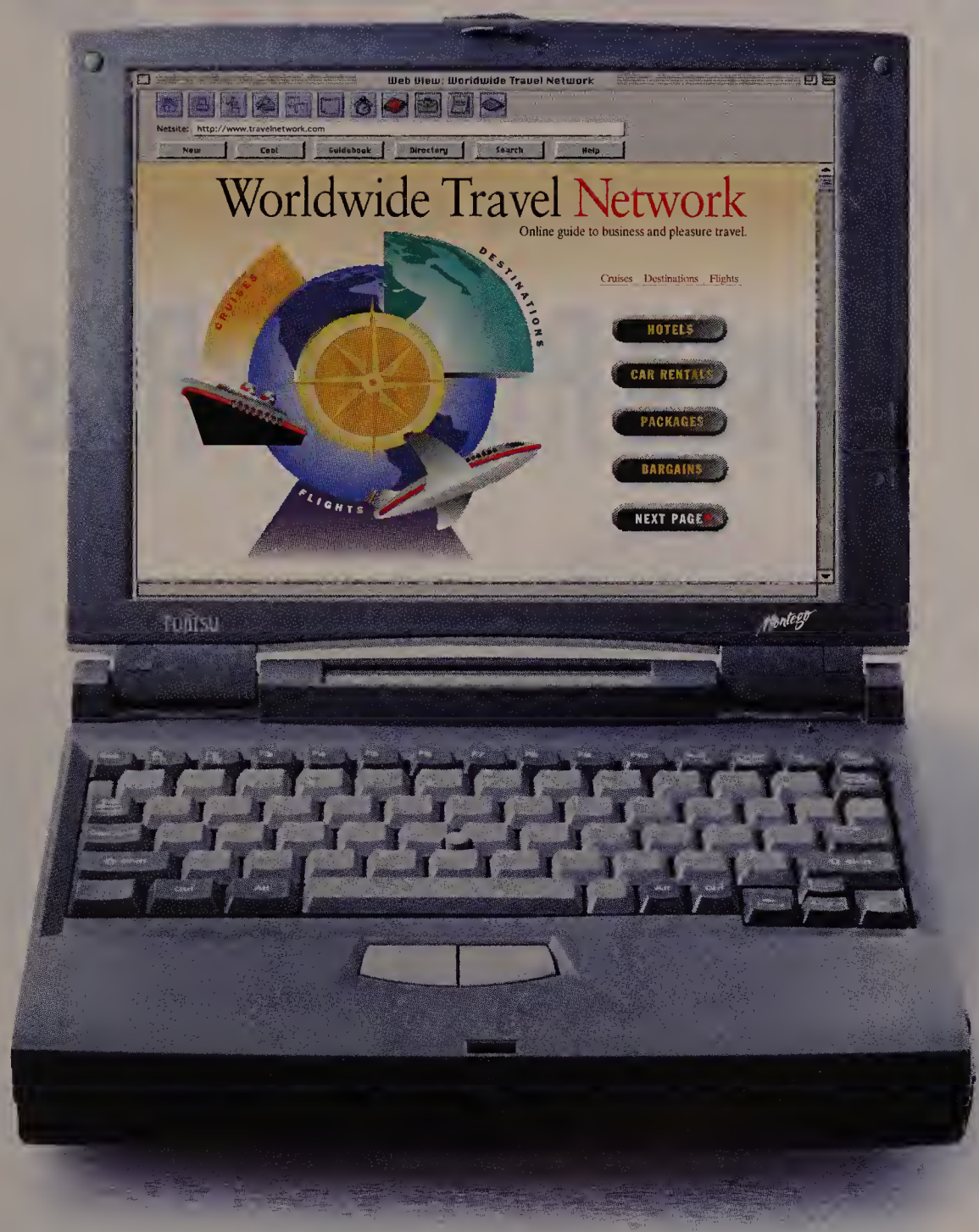

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TOP OF THE NEWS

Fastest PCs No Longer Have Intel Inside

Cyrix P-200+ PCs Beat

sions—Cyrix reworked the architecture to improve processing efficiency. The result is a processor that doesn't just sound fast, it *is* fast.

Cyrix has priced its new chip aggressively. It charges system vendor customers $499 each in volume, about $100 less per chip than Intel charges for the Pentium-200. As a result, While Cyrix intends the P200+ to compete with the Pentium-200, the P200+ systems also equal or surpass the average performance of Pentium Pro-200 systems—a feat that says as much about the Pentium Pro's weakness under Windows 95 and with 16-bit code as it does about the P200+'s strength (see "Pentium PCs Go Pro," August).

Intel's Best Pentiums

UNTIL NOW INTEL defined Pentium performance. Chip for chip, whatever clock speed you cared to compare, Intel took the gold. To stay ahead of rivals, Intel slashed prices even as it developed faster processors and increased production capacity. It seemed no competitor could catch Intel. But Cyrix has.

Not only caught Intel but surpassed it, with a 150-MHz Pentium–compatible chip, the **6x86-P200+**. Preproduction P200+ systems from Cyrix and two other vendors ran up to 5 percent faster than the average Intel Pentium-200 system. Sounds implausible, until you know the secret behind the P200+'s greater speed: The chip runs on a 75-MHz system bus, while Intel's Pentium-200 processor runs on a 66-MHz system board. Moreover, where Intel has pushed the current Pentium design to the limit—with only moderate performance increases in its fastest ver-

Preproduction systems with the P200+ ran up to 5 percent faster than the average Intel Pentium 200-MHz system.

P200+ system prices should be competitive with prices of P200 systems. For instance, Cyrix's own P200+ minitower with 16MB of EDO RAM, a 256K secondary cache, a 2.5GB hard drive, a Matrox MGA Millennium graphics card with 2MB of WRAM, a Sound Blaster AWE32 sound card, and a 17-inch monitor lists for $2699. A similarly configured Dell Dimension XPS P200 is close to $4000.

THE NEED FOR SPEED

WE WERE SURPRISED that all three preproduction P200+ systems we tested—from Cyrix, Micro Express, and HiQ—surpassed the average performance of PCs based on Intel's Pentium-200 CPU.

With a score of 227, **HiQ's CS 200 PowerStation** had the best PC WorldBench performance of the three P200+s, about 5 percent better than the average comparably configured Pentium-200 system. For $2859, the HiQ delivers 32MB of RAM; 512K of secondary cache; a 2.15GB hard drive; a Matrox MGA Millennium graphics card with 2MB of WRAM; an 8X CD-ROM drive; a Sound Blaster 16 sound card; and a 17-inch monitor. The $2499 **Micro Express MicroFlex-686/200+**, with an almost identical configuration, followed closely with a score of 225, about 4 percent faster than the Pentium-200 average. (The HiQ and Micro Express were compared to Pentium-200 PCs with 512K of secondary cache.) The Cyrix high-end $4999 system, scored 223—3 percent better than similarly configured Pentium-200 systems. The **Cyrix 6x86 P200 System** has ▶

EDITED BY
Russell Glitman and Randy Ross

PHOTO-ILLUSTRATION BY JEFF BERLIN; PHOTOGRAPHY BY JOHN GREENLEIGH, ICONS BY JEFFREY PELO

JUST IN

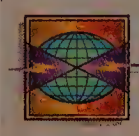
RAM Scam Part II

Z-MEMORY EXPERTS, one of the memory brokers at the center of *PC World*'s July "RAM Scam" report, has disappeared. According to sources, Z-Memory changed its name to **Nevada Micro** in June, then sold its assets to **Imagination Enterprises**, a computer retailer that also does business under the name IMG. Z-Memory was owned by **Don Royal Smith** of Boulder City, Nevada. Smith has operated several mail-order firms in Southern California and Nevada that went out of business owing customers hundreds of thousands of dollars. IMG representatives deny any relationship to Smith; however, at least two IMG employees were formerly employed by Smith. *PC World* has also learned that **Smith was arrested** on July 16 in Clark County, Nevada, on three felony counts of issuing checks with insufficient funds. More charges are expected. —*A. F.*

DirectX Warning

IF YOUR graphics board vendor doesn't offer drivers for **DirectX**, Microsoft's new multimedia technology, you could be confused when the new DirectX games hit. The DirectX setup program, included with apps that use DirectX, checks to see if your driver is Microsoft-certified. If it's not, DirectX may replace the driver with Microsoft's—without warning. You'll get DirectX benefits but may lose graphics board performance and access to utilities often included with a board vendor's drivers. —*B. G.* ▶

INTERNET



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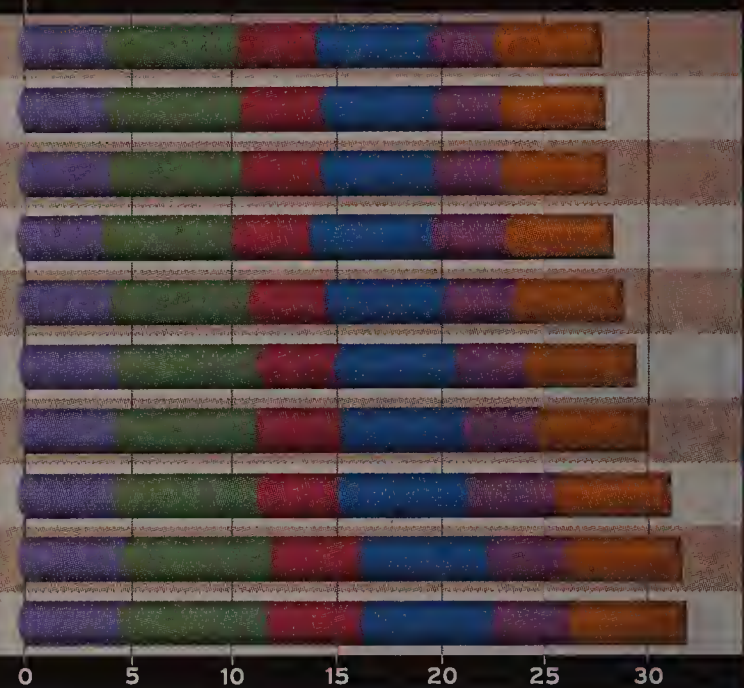
TEST REPORT

150-MHz 6x86-P200+ PCs Pass Pentium-200s

PC Worldbench Score	SYSTEM	CPU	RAM (MB)	Secondary cache (K)
227	HiQ CS 200 PowerStation	6x86-P200+	32	512
225	Micro Express MicroFlex-686/200+	6x86-P200+	32	512
223	Cyrix 6x86 P200 System	6x86-P200+	32	256
223	Average of 6 Pentium Pro-200 PCs	Pentium Pro-200	32	256
217	Average of 4 Pentium-200 PCs	Pentium-200	32	512
213	Average of 2 Pentium-200 PCs	Pentium-200	32	256
209	Average of 5 Pentium-200 PCs	Pentium-200	16	512
203	Average of 2 Pentium Pro-150 PCs	Pentium Pro-150	32	256
197	Average of 3 Pentium-200 PCs	Pentium-200	16	256
197	Average of 2 6x86-166+ PCs	6x86-P166+	16	256



Word 7.0 for Windows 95
Excell 7.0 for Windows 95
Picture Publisher 6.0 for Windows 95
Paradox 5.0 for Windows 95
WordPerfect 6.1 for Windows
1-2-3 release 5 for Windows

Higher PC WorldBench scores are better. For a description of the PC WorldBench 1.0 tests, see PC World Online (http://www.pcworld.com). Data based on PC WorldBench testing conducted by the PC World Test Center. All rights reserved.

32MB of RAM, 256K of secondary cache, a Matrox MGA Millennium graphics card with 2MB of WRAM, a 15-inch monitor, and a 4GB SCSI-2 hard disk controlled by a Fast/Wide SCSI cache controller with 64MB of DRAM.

The differences in performance are likely due to the various states of the preproduction motherboards the three vendors used.

HOW'D THEY DO THAT?

THE CYRIX P200+ provides a classic example of why you shouldn't base performance predictions solely on a chip's internal processing speed: At 150 MHz, the P200+ runs at a slower internal processing speed than the 200-MHz Pentium, but it gives better performance. Its advantage has as much to do with the system bus as with the chip. The 75-MHz speed of a P200+'s system bus means that data leaving the CPU doesn't slow down as much as it does when it leaves a Pentium-200 on a 66-MHz system bus.

Beyond system bus speed, the P200+ also benefits from a more advanced architecture than the Pentium's. Like the Pentium, it's *superscalar*—meaning it supports two pipelines to process instructions. But the P200+ makes more efficient use of its time with *out-of-order completion*—a technique that pushes one instruction ahead of another in the pipeline if the first instruction is delayed. Intel's Pentium processor relies on *branch prediction*, which can delay the processor as it guesses which instruction will be required next.

Expected Ship Dates for New Intel, Cyrix, and AMD Chips

Q4 1996
AMD K5-PR150
AMD K5-PR133
AMD K5-PR120
Q1 1997
AMD K5-PR166
Cyrix M2[1]
Intel P55C
Q2 1997
AMD-K6[1]
Intel Klamath[2]
Q4 1997
Intel P55C OverDrive
Intel Deschutes 300-MHz P6
Intel Merced P7
1998
Cyrix M3

[1] 32-bit with MMX extensions.
[2] Pentium Pro with support for MMX extensions but without a built-in secondary cache.
Source: Microprocessor Report and Intel and Cyrix reports.

"Intel's problem is, they are pushing the current product as fast as it can go to get it to P200," says Linley Gwennap, editor of the *Microprocessor Report* newsletter. Cyrix, on the other hand, can continue to increase its CPU performance simply by improving its CPU manufacturing process.

"The bottom line is, [the P200+] is faster," says Cyrix marketing manager Ben Williams. "It takes instructions and performs them more optimally. The megahertz game is no longer the way to portray [the relative performance of] a product or processor."

UPGRADABLE INNOVATION

THE CYRIX DESIGN has an important long-term benefit: The next generation of Cyrix processors, the M2, will sup-

port Intel's MMX multimedia and communication extensions to the x86 instruction set and fit in the same socket the 6x86 uses. This socket means that system vendors won't have to retool their PC lines, which should let them bring M2 systems to market rapidly and keep costs down. The M2 will also be available retail as an upgrade chip, which means that users who buy a 6x86 today will be able to upgrade to the M2. The M2 line is scheduled to go into volume production in early 1997.

Cyrix is not without handicaps; chief among them is the limited availability of chip sets and system boards that support the P200+'s 75-MHz bus speed. Says Gwennap, "Cranking up the bus speed can make life more difficult for the motherboard designer." At press time, P200+ system boards were in final design stages and sparsely available. That may limit your options.

As of midsummer the only top-tier PC vendor to announce plans for P200+ systems was IBM, which also manufactures 6x86 chips for Cyrix. IBM plans to use the chip in its business PCs this fall and is also evaluating the processor for its Aptiva line.

TO BUY OR TO PASS?

THE BOTTOM LINE: The P-200+ is fast and keeps the competitive heat on Intel. That's a plus for all buyers. P200+ systems surpass those that use Intel's P-200 and are 10 to 15 percent faster than PCs based on the P-166. That's a reason to consider Cyrix if you demand the ultimate in performance. Intel, the torch passes to Cyrix.

—Gabrielle Mitchell ■

Cyrix P200+ systems

PROS: Faster and cheaper than average Intel P200 PCs.

CONS: Available mostly from third-tier vendors.

VALUE: Sets new price/performance mark.

6x86 P200 System
List price: $4999
Cyrix
800/340-7971
http://www.cyrix.com
READER SERVICE NO. 836

HiQ CS 200 PowerStation
List price: $2859
HiQuality Computer Systems
800/827-5836, 408/245-5836
http://www.hiq.com
READER SERVICE NO. 837

MicroFlex-686/200+
List price: $2499
Micro Express
800/989-9900
READER SERVICE NO. 838

A Day Late and a Clock Speed Short

WHILE CYRIX HAS KEPT PACE with Intel's aggressive Pentium development, Intel's oldest competitor, Advanced Micro Devices, has frequently missed deadlines for its Pentium-class chips. AMD only just released its own 100-MHz Pentium competitor, the **K5-PR100**—more than a year after Intel's P-100 appeared.

Despite its tardy arrival, the K5-PR100 is no slouch. In benchmark testing using a reference system from AMD with 16MB of RAM and 256K of secondary cache, AMD's processor achieved a PC WorldBench score of 168; the average mark for similarly configured Intel Pentium-100 systems is 160. The K5 particularly excelled in our test with Picture Publisher 6.0 for Windows 95, where it was nearly 30 seconds faster than the average P-100.

The chip's greatest advantage may be its cost. With volume pricing of $84 each, the K5-PR100 costs about 25 percent less than Intel's chip. This aggressive pricing, however, will likely force the processor into the low end of the market with smaller system vendors such as CyberMax.

Moreover, Intel expects Pentium-120 and Pentium-133 PCs to define the sweet spot in the market this fall, with system prices hovering around $1200. The average PC WorldBench score for a Pentium-133 is 176. If the K5-PR100's strong WorldBench score indicates future AMD performance, the company's fall lineup—the K5-PR120, K5-PR133 and K5-PR150—could provide a competitive alternative to Intel's Pentiums.

AMD says its K5-PR166 will be in limited production this year with volume shipments coming early in 1997, along with the AMD-K6, a 32-bit processor that will support Intel's MMX multimedia extensions to the x86 instruction set. To compete seriously with Intel, AMD must ship these chips on time and prove itself a reliable supplier of the latest technology. Then it may once again attract major system vendors such as Compaq.

PCs to Sport New Floppy Drives

IOMEGA'S 100MB ZIP drive will soon appear in PCs from popular vendors, including IBM, HP and Acer. Meanwhile, backers of the **120MB LS-120 drive**—3M, Matsushita-Kotobuki Electronics, and Compaq Computer—announced similar deals. Though the competing drives offer comparable capacities, the LS-120 has a key advantage; it can read and write standard 3½-inch 1.44MB floppy disks. —*M. D., R. F.*

DVD Delayed?

VENDORS HAVE FAILED to resolve copy-protection and licensing issues, a development that could delay shipment of DVD players and DVD-ROM drives from this fall to early next year, analysts say. DVD players, which may someday replace VCRs, bring superior video and audio quality to movies played from 4.7GB discs. The devices are expected to sell for $500 to $700. However, **Toshiba America and Panasonic** are still pledging a fall launch. —*L. M.*

Universal Serial Bus on Schedule

BY YEAR-END, expect to see PCs and peripherals sporting the much-anticipated **Universal Serial Bus connector**, a high-speed port more than ten times faster than the lowly serial port it's designed to replace. Additional USB benefits over ▶

ICON: JEFFREY PELO; PHOTO: JOHN GREENLEIGH

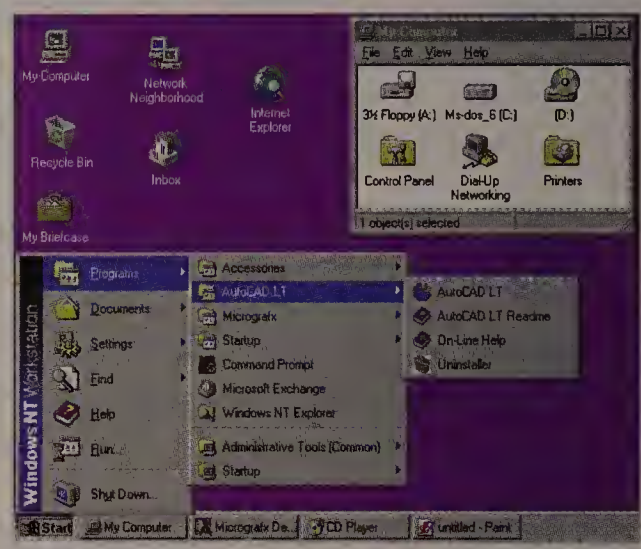
NT 4.0: Easier, More Powerful, Some Compatibility Issues

BETA

FOR THE PAST YEAR, selecting the right version of Windows has been tricky at best. You could go with Windows 95, which boasts Microsoft's latest, most usable interface. You could opt for Windows NT Workstation 3.51 and get a more reliable operating system that has more network-oriented features and takes better advantage of the latest hardware. Or you could do what some corporations did: stick with Windows 3.1 and bide your time until the release of **Windows NT Workstation 4.0**, the first Windows version that combines a friendly interface with Windows NT's advanced features. A number of companies chose to stick with Windows 3.1 because adopting an operating system as a corporate standard is a big decision. In addition, many businesses were unwilling to choose ease of use over power and commit to Windows 95 when something better might be just around the corner.

Microsoft plans to ship Windows NT 4.0 by the end of the summer. But does it truly combine the best aspects of Win 95 and NT? Says beta tester Tom Bernhardt, "We think it's great." Bernhardt is a senior technology analyst at Star Enterprise, the $8 billion oil refining and marketing organization that operates Texaco gas stations in the eastern half of the United States. "It offers Windows NT's historic stability and management, along with a new interface and usability features." Star Enterprise intends to roll out NT 4.0 gradually to about 3500 of its PC users, most of whom are still running Windows 3.1.

Based on our first hands-on experience with a prerelease version of NT 4.0, we're impressed by its potential, too. But compatibility with existing hardware and applications will be a problem for many users. Moreover, we still need to test the final version before we can assess such vital issues as speed and stability. We also want to compare NT 4.0 with the new version of IBM's OS/2 Warp operating system.

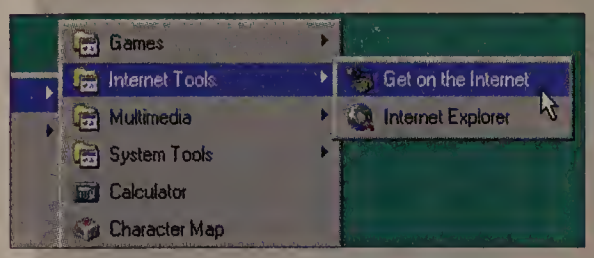


WINDOWS NT 4.0'S NEW INTERFACE is a dead ringer for the look and feel of Windows 95.

Not Quite Windows 96

BETA

MICROSOFT IS QUIETLY shipping PC makers a revision of Windows 95 that bundles bug fixes, new drivers, utilities the company released online during the year since Windows 95 shipped, plus other new features. The revision, dubbed **OEM Service Release 2**, also includes free Internet tools. Systems preinstalled with OSR2 should be available by October. But buying a new system may be the only way users can get all of OSR2's improvements. Microsoft hasn't said when OSR2 will replace the current shrink-wrapped version of Windows 95 in retail stores. Moreover, the retail product will probably omit some key features.



EASY INTERNET ACCESS: OSR2 includes a utility that helps you set up an account with a local Internet provider.

Perhaps the most significant addition in OSR2 is a new file system, FAT32, that supports hard disks larger than 2GB and allocates disk space more efficiently than the 16-bit FAT system DOS and Windows 95 use. A 2GB FAT partition, for example, is divided into 32K clusters, which means that a 2K file wastes 30K of disk space. By comparison, a 2GB FAT32 partition is divided into 4K clusters, which produce less waste and can save tens to hundreds of megabytes on large drives. FAT32 will be available only in the OSR2 version distributed with new PCs.

Most of the new version's improvements focus on Microsoft's Holy Grail—the Internet. In addition to including a copy of the company's Internet Explorer 3.0 browser, OSR2 bundles a new Internet e-mail module for Windows Messaging (the in-box formerly known as Exchange—see this month's *Bugs and Fixes* for the details). Other additions include stand-alone Internet mail and news readers, the NetMeeting Internet telephony application, and content filters that let parents protect their kids from online smut. OSR2 provides a connection wizard that enables you to set up an account with an Internet service provider in your area, using a credit card. Many of these Internet tools will not appear in the retail version of OSR2.

OSR2 offers numerous smaller enhance-

WINDOWS NT 4.0 MULTITASKS PROGRAMS more smoothly and safely than Windows 95, says 3-D designer Mark Huppertz.

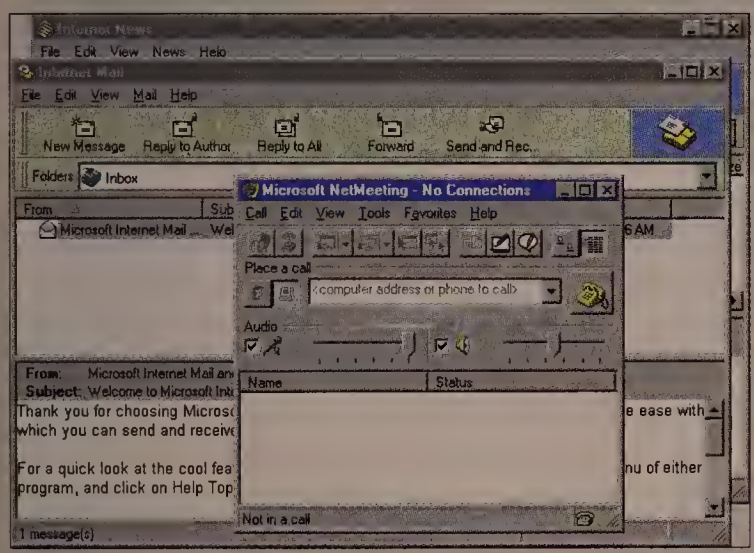
PHOTO: DANIEL PEEBLES; ILLUSTRATION: BUD PEEN

Code-named Merlin and due out this fall, the new OS/2 Warp will include technology available to Windows users only at extra cost—notably voice recognition, which lets you operate programs and dictate a document by speaking into a microphone. Merlin also adds built-in support for Java applets, and an e-mail client based on Lotus's Notes groupware package. As before, OS/2 will be able to run DOS and Windows 3.1 programs—but not Win 95 programs.

LOOKS LIKE WINDOWS 95...

THE CURRENT VERSION of Windows NT has one major liability: It looks and acts like Windows 3.1. And although NT 3.51 lets you use long file names, it's built around Program Manager and File Manager, two crude Windows 3.1 tools for managing programs, documents, and other files. It also lacks some Windows 95 conveniences such as the ability to drag programs and documents onto the desktop, or click the right mouse button to see a context-sensitive menu of command options.

NT 4.0 addresses some of these issues. Its new interface is the same one Windows 95 uses: Say good-bye to Program Manager and File Manager, and hello to Start Button, My Computer, Taskbar, Network Neighborhood, and Briefcase. Windows NT 4.0 also includes the Windows Messaging e-mail client (formerly known as Exchange), Windows 95's Paint and HyperTerminal applets, and an improved help system. In most respects, this environment is much ▶



INTERNET TOOLS: The Windows 95 update sports new Internet mail and news readers, as well as a telephony application called NetMeeting.

ments. The Display Properties dialog box now lets you change color depth without restarting, and it also adds the 3-D screen savers familiar to Windows NT users. Dial-up scripting, formerly a separate utility you had to download or install from the Windows 95 CD-ROM, is part of every Dial-Up Networking connection's Properties sheet. You also get two more communications programs formerly available only via download: Wang's TWAIN-compatible Imaging program for scanning, annotating, and faxing documents, and the AnswerStation answering-machine software. Power management now extends to PC Card modems, but there's still no support for the Universal Serial Bus, a high-speed serial port expected on new PCs (USB support is expected in the fall).

Another nice inclusion is DriveSpace 3, the enhanced disk-compression utility that was a key reason for purchasing the company's Plus add-on. Microsoft says it will release as many as three more service upgrades before the next major release of Windows—code-named Memphis—ships sometime in 1998. **—Scott Spanbauer**

serial ports include plug-and-play installation of peripheral devices and the ability to connect multiple devices to a single connector. At a recent trade show, vendors displayed a range of USB peripherals, among them keyboards, joysticks, telephones, monitors, and speakers. The speakers may herald the end of the sound card; the all-digital design eliminates the need for an add-in card to convert digital signals from the PC into analog signals for the speaker. —*R. R.*

TidBytes

A New Notebook From Gateway: The **Solo 2100** notebook not only accommodates two batteries or a CD-ROM drive and a battery, it also has better screen resolution than its predecessors. Pricing begins at $2699 for a Pentium-100 system with an 11.3-inch dual-scan SVGA display and a 540MB removable hard drive. **Packard-Bell's Desktops:** The **Platinum Series PCs** feature videoconferencing, VocalTec's Internet Phone software, game-oriented 3-D graphics, and a module that provides push-button control over telephony, CD audio playback, and the TV tuner. Prices without monitor will run from $1500 to $3000. **Compaq's Home Systems:** Enhancements in new Presarios will resemble those in Packard Bell's Platinums. However, the Presario features will appear in a wider variety of systems. Prices range from $1699 to $3499. ■

WINDOWS TAKES CARE OF BUSINESS

Corporate buyers prefer Windows 3.1 and NT

Corporate reseller and dealer sales

- 47% WINDOWS 3.1
- 1% OS/2
- .5% MAC OS
- 10.5% DOS
- 14% WINDOWS 95
- 27% WINDOWS NT

Source: Computer Intelligence StoreBoard Channel Tracking Study for April 1996

more inviting than that of Windows 3.1. Still, if you dislike certain Windows 95 features, such as its much-criticized Explorer file manager, you won't be any more pleased by what NT 4.0 offers.

NT 4.0 does omit a few of Windows 95's amenities. Most significantly, it lacks support for configuration of Plug and Play peripherals. For now, adding peripherals to an NT system is usually much more arcane than with Windows 95. In addition, the operating system lacks built-in power management, so notebook users may find that their batteries drain far more rapidly than with Windows 95. Microsoft does not plan to add these two features until NT's next major makeover sometime in 1998, although some notebook manufacturers intend to add their own power-management utilities before then.

...WORKS LIKE NT

NT 4.0 MAY HAVE adopted Windows 95's outer shell, but underneath it's still an operating system designed for advanced users, especially those whose PCs are connected to networks. Much more than Windows 95 does, it also strives to make life easier for your IS department, with such features as the User Manager—a sophisticated password-protection system that can assign differing levels of access to users who share the same PC. Network managers charged with implementing an intranet will also like NT 4.0's new Peer Web Services, a basic World Wide Web server feature designed to distribute Web pages over a local area network.

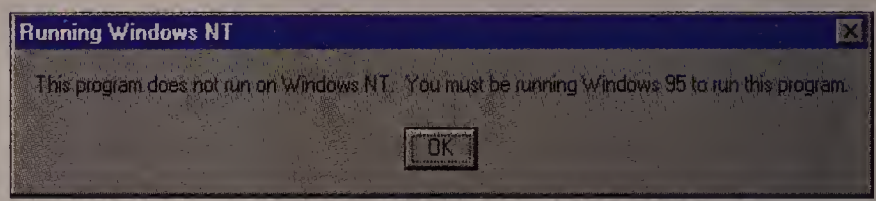
You needn't be an IS professional to appreciate Windows NT's emphasis on preventing crashes, minimizing damage when crashes do occur, and determining what caused them. "I can keep two or three copies of AutoCAD open alongside Photoshop and switch between them without my PC blowing up," says NT 4.0 beta tester Mark Huppertz, a partner and designer in Ventenas Computer Systems Engineering, a company in Albuquerque, New Mexico, that specializes in 3-D animation. "And if one application *does* go down, the others are okay."

To avoid the problems that cause crashes and data loss, the OS carefully monitors applications and device drivers as they access a PC's hardware. It also puts programs in separate chunks of memory so they can't bother each other. When an application malfunctions and you press <Ctrl>-<Alt>-<Delete> to recover, it gives you a bevy of options: Besides shutting down a single application or the entire system, you can instantly password-protect the PC until you've had a chance to analyze what happened and make sure your data's safe, a maneuver akin to a police officer sealing off a crime scene. More technical users can also call on a rich set of diagnostics and other tools for tracking down the cause of a crash.

COMPATIBILITY CONSTERNATION

NT 4.0 IS VERY FINICKY about the hardware and software it works with. While Windows 95 can use old DOS and Windows 3.1 device drivers as well as new 32-bit ones, NT 4.0 needs its own NT-specific 32-bit drivers. Microsoft provides a large collection with the OS itself and is encouraging the development of more, but they're not yet plentiful. Also, just because a computer or peripheral works with other versions of Windows doesn't mean it will operate with NT 4.0. (The OS comes with a list of products that Microsoft has tested and found compatible.) "There's a lot of hardware not on the list that does work with NT," says George Roettger, a technical advisor on CompuServe's NT forum. "But if it's not on the hardware compatibility list, it's a gamble."

Compatibility with software applications is also far from universal. The beta version of Windows NT 4.0 comes with a list of Win 95, 3.1, and DOS applications that may present difficulties, ranging from minor malfunctions to a total inability to run. Numerous ▶



PROCEED WITH CAUTION: Microsoft's NT 4.0 lets you run many but not all DOS, Windows 3.1, and Windows 95 applications.

CHECKLIST

Windows NT 4.0 Upgrade

TEMPTED BY WINDOWS NT Workstation 4.0's improvements? Before making the move, take a look at your current PC setup and determine how well suited it is to NT.

- **YOUR PC:** The upgrade is most likely to go smoothly if your computer is on Microsoft's Hardware Compatibility List; an NT 4.0-specific version of the list is available at http://www.microsoft.com.
- **YOUR PERIPHERALS:** NT 4.0 needs its own drivers; even earlier NT ones may not work. Your printer and other devices must be supported through drivers from the OS or the device manufacturers.
- **YOUR SOFTWARE:** Check with the vendors of all your vital apps to make sure these programs will run with NT 4.0; if not, ask about the vendors' plans to make them do so. If your business runs custom applications, test them for compatibility with NT 4.0.
- **YOUR CURRENT OPERATING SYSTEM:** NT 4.0 installs nicely over Windows 3.1, but Windows 95 users who move to NT will need to reinstall their applications before they'll run with NT.

Print servers for the control freak in you.

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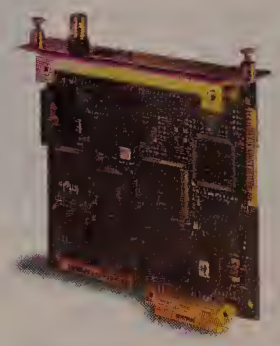
Manage and control all your printers from a single console. Both our external and new internal print servers support NetWare, Windows NT,* LAN Manager,* LAN Server,* AppleTalk,* and multiple UNIX* flavors.*



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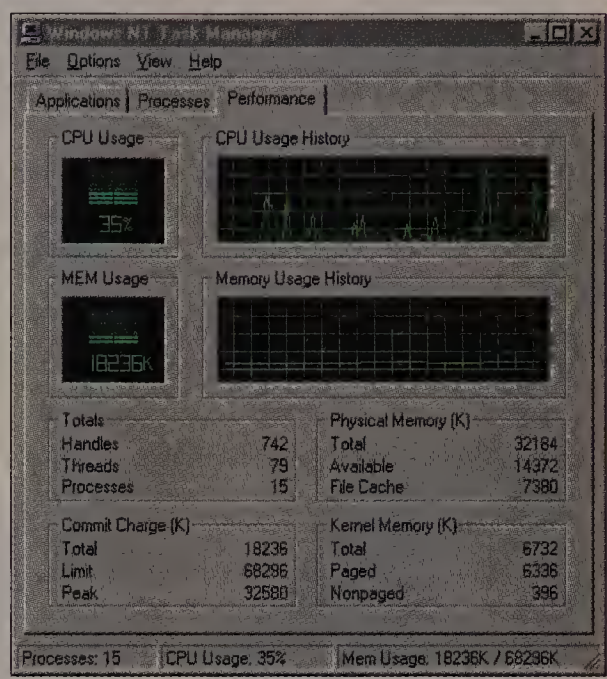
significant third-party Windows 95 applications, such as Lotus's SmartSuite 96 and Corel's WordPerfect Suite 7, are on this list. Even Microsoft applications aren't immune: The list warns of possible display glitches with Word 7 and Excel 7. And as with earlier versions of NT, most communications and utilities packages will not work unless they were designed for NT.

In many cases, these incompatibilities may be short-lived. Both Corel and Lotus plan to have NT 4.0 versions of their software suites ready at about the time the OS becomes available. Other software vendors may quickly fall into line: "It's inevitable," predicts Dwight Davis, editorial director at the industry newsletter *Windows Watcher*, recalling that many developers learned a hard lesson during the rocky transition from DOS to Windows 3.0.



POWER USERS CAN DIAGNOSE SYSTEM ILLS using NT 4.0's feature-filled Task Manager.

HARNESSING THE PENTIUM PRO

NT HAS A REPUTATION as a resource-hungry operating system, but with PC prices in free fall, its requirements aren't as daunting as they once were. Microsoft recommends that you run NT 4.0 on a PC with at least a 60-MHz Pentium processor and 16MB of RAM. We put the OS through its paces on a Dell Dimension Pentium-75 with 16MB of RAM and were happily productive in a variety of 16- and 32-bit applications. However, with CAD and serious graphics, you'll probably want more than 16MB, says Phil Holden, a Microsoft product manager. Adobe, for instance, recommends a minimum 16MB of RAM if you use Photoshop with Windows 3.1 or 95, but it suggests 32MB for NT users.

To see the operating system at its best, you may need a PC sporting the latest technologies, such as a Pentium Pro processor and a 128-bit graphics adapter. Unlike Intel's 486 and standard Pentium processors, the Pentium Pro is optimized to run 32-bit code. (NT has always been a pure 32-bit operating system, unlike Windows 95, which retains some 16-bit code.) Microsoft has also beefed up NT 4.0 to enhance performance on PCs with fast graphics subsystems.

We can't make any sweeping statements about NT 4.0's performance until we have the final version, but our informal tests hint at exciting possibilities. On a Dell OptiPlex 200-MHz Pentium Pro PC with 32MB of RAM and a 128-bit graphics card, we used Picture Publisher 6.0 to load a whopping 72MB PhotoCD image into memory and display it on screen. This task took about 2 minutes using Windows 95, versus only about 1 minute using the prerelease version of NT 4.0. Opening the image in NT 4.0 on our Dell Pentium-75 system was also quicker than in Windows 95, but the difference was much less striking.

WIN NT VERSUS WIN 95

DESPITE NT 4.0's Windows 95–like makeover, many PC users will still be better served by the real thing. Between its Plug and Play features, greater compatibility, and readily available drivers, Windows 95 is simpler to get up and running, particularly if you plan to add peripherals and software not designed for NT 4.0. That means Windows 95 is probably the choice for home and small-office users who must maintain their own PCs.

Of course, if you work in a large company, responsibility for most hardware and software worries probably lies in the collective lap of your IS department. As a result, you may find that NT 4.0 has become your designated OS, regardless of your personal preference. Once you're sure that NT will work smoothly with your PCs, peripherals, and application software, such a fate shouldn't be anything to fear: NT 4.0 is shaping up to be an OS that should keep both you and your business's full-time technical gurus reasonably happy.

—Harry McCracken ■

Windows NT Workstation 4.0
Microsoft
800/426-9400
List price: less than $300 (price not set at press time)
READER SERVICE NO. 839

FEATURES COMPARISON

WHICH TO PICK? Operating system choices continue to evolve.

● Yes ○ No

Applications	In short	Minimum recommended configuration: RAM (MB)	Processor	Application support: DOS	Windows 3.1	Windows 95	Backuputility	Applications, features included: Disk compression	E-mail	Peer-to-peer networking	Spreadsheet	Web browser
Windows 3.11	Familiarity, low hardware demands keep OS popular.	4	386SX	●	●	○	●	●	○[1]	○[1]	○	○
Windows 95	Mainstream 32-bit version has some 16-bit code.	8	386DX	●	●	●	●	●	●	●	○	○[2]
Windows NT Workstation 4.0	Friendlier interface, still persnickety about compatibility.	16	Pentium-60	●	●	●[3]	●	●	●	●	○	●
OS/2 Warp Merlin[4]	IBM's new 32-bit OS adds voice recognition, Java.	24[5]	Pentium-90[5]	●	●	○	●	○	●	●	●	●

[1] Windows for Workgroups 3.11 includes e-mail and peer-to-peer networking. [2] Not included in current retail version; will be part of OSR2 version shipped with new PCs beginning in October. [3] Can run most Win 95 applications that display Microsoft's Designed for Windows 95 logo. [4] Beta version of new OS/2 Warp is code-named Merlin; final name was not set at press time. [5] If voice recognition is not used, minimum is 486DX2-66 with 12MB of RAM.

7 secrets you need to know about your data

All new for Windows 95 & NT 3.51!

1 You need the big picture to make good decisions. With SPSS' statistical charts, you can better understand your data. In this boxplot, you see the average, minimum, maximum and distribution all at the same time.

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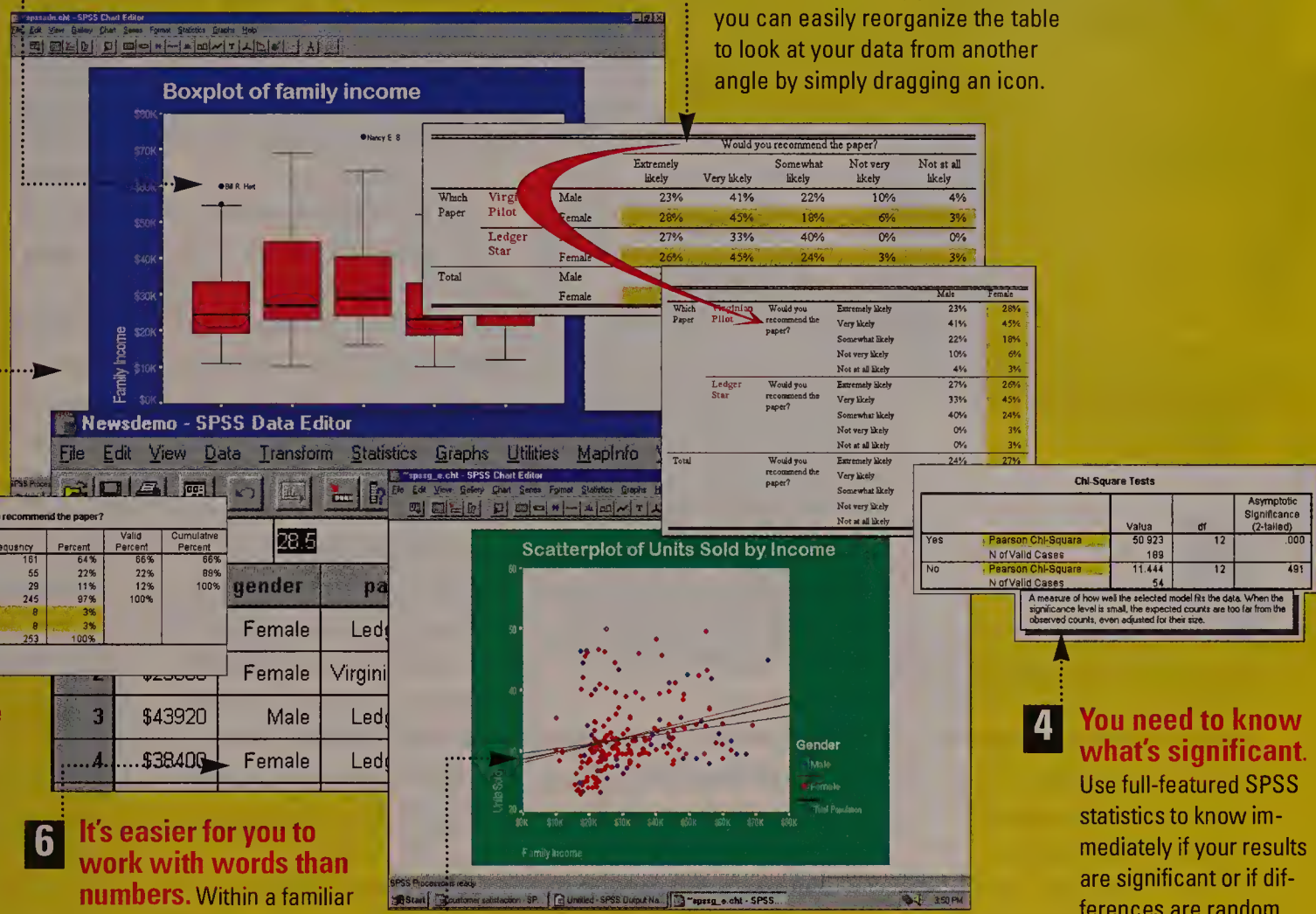

4 You need to know what's significant. Use full-featured SPSS statistics to know immediately if your results are significant or if differences are random. If your stats are rusty, click "What's This?" to get explanations, definitions and rules of thumb for statistics or results.

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SPSS gives you Real Stats. Real Easy. SPSS is a complete tool kit of easy-to-use statistics, graphs and reports that will help you unlock the secrets hidden in your data. Enter your data or directly import it from spreadsheets, databases or ASCII files. SPSS is used for:

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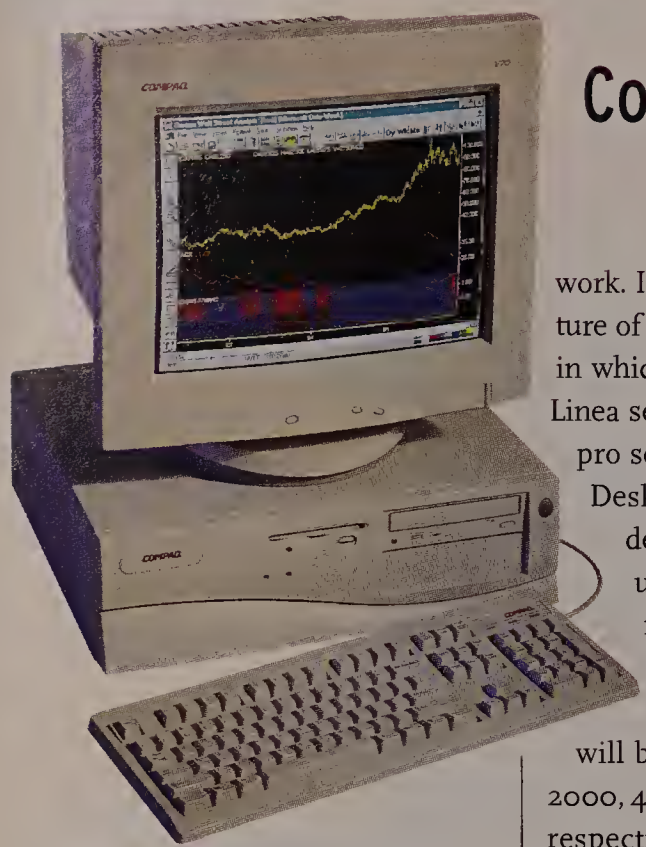
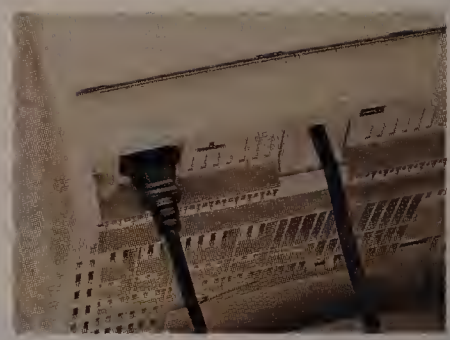
A5837

Compaq's New Deskpro Line Has Crash Detection





A SMART PC: The Deskpro 2000, left, uses software utilities to alert you to an impending crash. Unique plugs on the V70 monitor, above, allow placement flush with a wall.

COMPAQ'S OVERHAUL of its business PC line this summer launches a generation of Deskpro PCs that use what the firm dubs Intelligent Manageability to protect data from theft and corruption.

Intelligent Manageability combines desktop and LAN hardware and software utilities to help prevent unauthorized data access, detect disk or system failure, and manage PCs remotely over the network. It is the distinctive feature of Compaq's new lineup in which the entry-level ProLinea series, midrange Deskpro series, and power-user Deskpro XL series are redesigned and renamed under a simplified naming scheme. The new lines target the same markets but will be called the Deskpro 2000, 4000, and 6000 series, respectively. We took one of the first arrivals out for a spin—a 200-MHz Pentium **Deskpro 2000** that should cost less than $2789 without a monitor—and found it to be a solid performer.

The Deskpro 2000 value line starts at about $1100 for a 100-MHz Pentium version. Midlevel models offer a range of Pentiums from 120 MHz to 200 MHz. The entry- and midlevel Deskpro 2000s come preloaded with both Windows 3.1 and 95; you choose which to install during the setup process. High-end Deskpro 2000s run Windows NT on either 180-MHz or 200-MHz Pentium Pro chips. Top-of-the-line systems should cost about $3400.

Our PC WorldBench tests of the 200-MHz Pentium Deskpro 2000, with 32MB of EDO RAM and a 256K secondary cache, showed performance slightly above average for similarly configured systems (see test report) and better than systems with more cache. Our test unit features a 1GB Quantum Fireball hard drive, a Cirrus Logic 5436 graphics chip set with 2MB of DRAM—capable of 1024 by 768 resolution with 256 colors at an 85-MHz refresh rate—and an 8X CD-ROM drive. It accepts up to 128MB of RAM.

The Deskpro line stands out in its sophisticated management and security tools. To prevent data loss it uses Enhanced-IDE hard drives, available in 650MB to 2.5GB sizes, that track spin-up and seek times to detect problems before a crash occurs. When a fault is predicted, the software displays a warning and can initiate a tape backup on the PC or over the network.

To prevent data theft, Compaq provides an array of pass-

Deskpro 2000 Model 5200/1080

PROS: Intelligent Manageability protects PCs and data.

CONS: Average performance.

VALUE: Safety first.

Compaq Computer Corp.

800/345-1518

http://www.compaq.com

List price: $2789

READER SERVICE NO. 817

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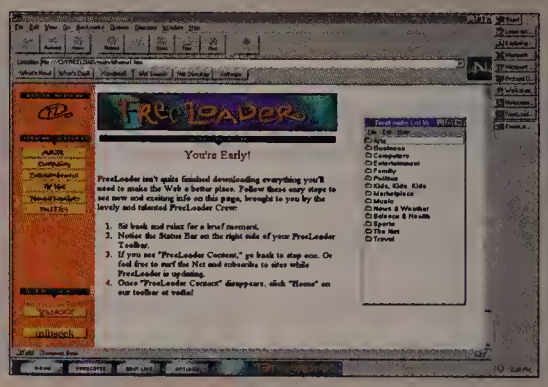
Offline Browsers Keep Online Bills in Line

IT DOESN'T TAKE LONG before the thrill of going online is replaced by the anxiety of out-of-line spending. That's when it's time to turn to offline browsing software, a new breed of browser utility that lets you track your favorite sites and keep online bills in line. Typical offline browsing utilities dial in during off-peak hours, grab all the sites you want, flag those that have changed, and organize them for you. The preeminent free offline tool is **FreeLoader** (http://www.freeloader.com). However, it's currently compatible only with the Netscape Navigator browser. For $50, **WebWhacker** (http://www.ffg.com/whacker.html) from ForeFront gives you scheduling wizards and some effective ways to organize the sites you've "whacked." **Traveling Software's WebEx** (http://www.travsoft.com/products/webex) evolved from the innovative Milk-truck Delivery, which Traveling recently acquired. For $29.95, it delivers the same basic features as other offline browsers. But if you've decided to shell out some bucks for an offline utility, your best bet is probably First Floor's $24.95 **Smart Bookmarks 2.0** (http://www.firstfloor.com), which is also an excellent tool for organizing sites. In fact, First Floor built the original bookmarking functions for Navigator, and its stand-alone product also works with other browsers. Almost all these offline utilities offers a free demo, so try them all. —Richard Overton



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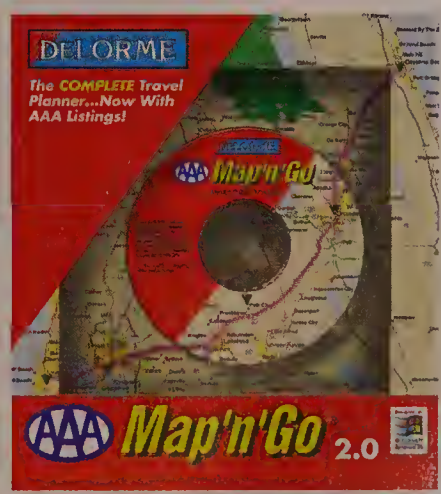

DELORME

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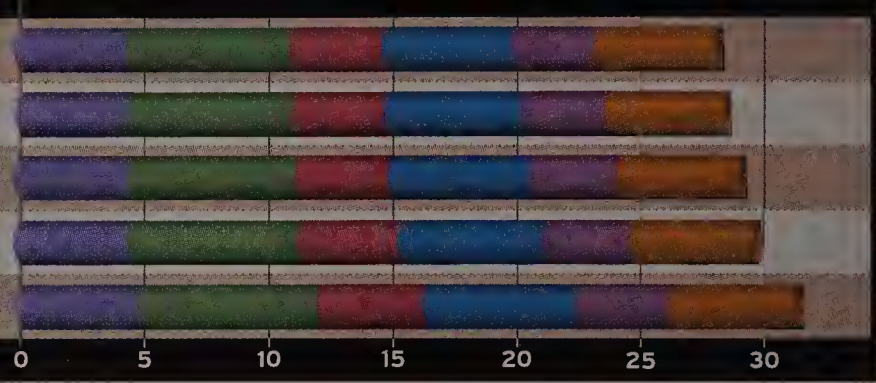
words that prevent the PC from booting from a floppy disk, disable the keyboard after a time-out, and prohibit changes to CMOS. The utilities also let you disable hard drive writes, block serial and parallel port data transfers, and even secure your system against Flash ROM updates.

All this fancy software is housed in a case that increases available slots and bays within the same footprint of prior models. Compaq also has a new 17-inch color monitor, the V70; its street price should be $720. **–Dean Andrews** ■

TEST REPORT

Deskpro 2000 Performs About Average

PC WorldBench Score	SYSTEM	CPU	RAM (MB)	Secondary cache (MB)
218	Compaq Deskpro 2000	Pentium-200	32	256
217	Average of 4 P-200 PCs	Pentium-200	32	512
213	Average of 2 P-200 PCs	Pentium-200	32	256
209	Average of 5 P-200 PCs	Pentium-200	16	512
197	Average of 3 P-200 PCs	Pentium-200	16	256



Word 7.0 for Windows 95
Excel 7.0 for Windows 95
Picture Publisher 6.0 for Windows 95
Paradox 5.0 for Windows
WordPerfect 6.1 for Windows
1-2-3 release 5 for Windows

Higher PC WorldBench scores are better. For details on the PC WorldBench 1.0 tests, see PC World Online (http://www.pc world.com). Data based on testing conducted by the PC World Test Center. All rights reserved.

Lowest Price Yet for a Digital Camera

TEST DRIVE

IT DOESN'T TAKE A CRYSTAL ball to foresee that color digital cameras have a great future among PC users. The devices let you add photos to documents and presentations on your desktop and in cyberspace. A digital camera is the ideal tool, creating quick and easy digital pictures. No film, no developing, no scanning—it's just point, shoot, and publish.

Enter the **Kodak Digital Science DC20 Camera**, list-priced at a groundbreaking $350. The DC20 is not only the least expensive digital camera on the market, it's also the most compact model we've seen (2.5 by 4 by 1.2 inches) and the lightest (4.2 ounces). It runs off a 3-volt lithium battery, comes with a serial cable for transferring the images from the camera to your PC's hard drive, and includes image enhancement software.

But the trade-off for the DC20's breakthrough price is lack of the image resolution, quality, and storage capacity found in more expensive products, such as the $599 Epson PhotoPC. The DC20's highest resolution is only 493 by 373 pixels; the PhotoPC has a maximum 640 by 480. And it can store only 8 high-resolution images or 16 standard resolution (320 by 240) versus 16 high resolution (640 by 480) and 32 standard resolution pictures for the PhotoPC. Our biggest disappointment is the DC20's mediocre color rendition: Many images had muted colors, compared to the same ones taken by the PhotoPC.

Moreover, the DC20 has no built-in flash; no expandable or external memory support to increase image storage; and no AC adapter, tripod mount, or ability to use add-on lenses and filters—all provided by the PhotoPC. **–Richard Jantz** ■

Kodak Digital Science DC20 Camera

PROS: Small and inexpensive.
CONS: Poor resolution; few options.
VALUE: You get what you pay for, but this camera is fun and cheap.
List price: $350
Eastman Kodak Co.
800/235-6325
http://www.kodak.com
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AN IMAGE from the Kodak Digital Science DC20 Camera (left) pales when compared with the same image from the Epson PhotoPC.

PHOTO OF CAMERA: JOHN GREENLEIGH

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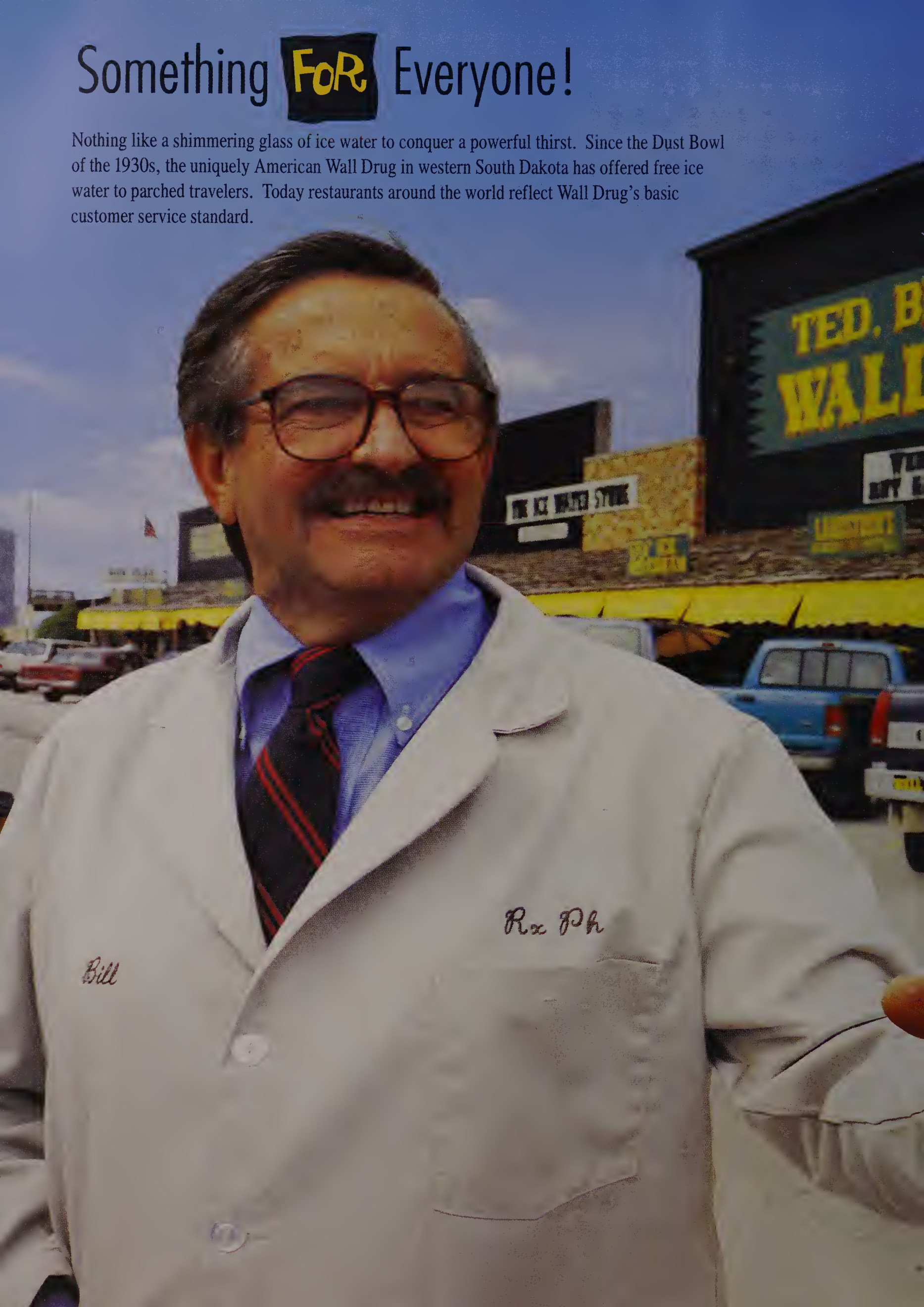
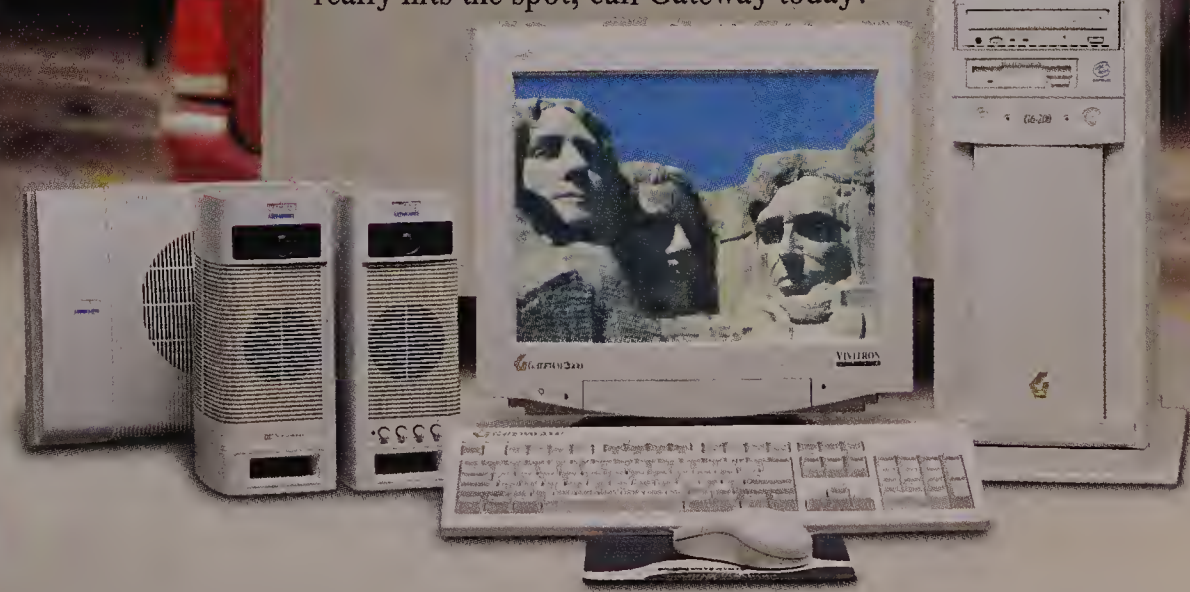


G6-200XL

Ahhh! There's nothing like quenching your thirst for power and creativity with one stellar PC. The G6-200XL features the fastest Pentium® Pro processor available, 32MB EDO DRAM and refreshing new technology like a CD-recordable drive all at an incredible value. Our Pentium Pro processor-based systems are comparable in price to Pentium-processor based PCs, plus their next-generation platform packs even more performance punch when running 32-bit applications like Office 95. Ask your sales rep about these systems' amazing benchmark scores. Invest in *your* future with a Pentium Pro processor-based PC that really hits the spot, call Gateway today!



intel inside
PENTIUM® PRO PROCESSOR

GATEWAY 2000
"You've got a friend in the business."®

888-888-0363

Open-Road FREEDOM!

Each summer road warriors from every imaginable background throw a leg over their rumbling hogs and head for Sturgis, South Dakota. Since 1938, this small town has been the site of a huge, week-long motorcycle rally attracting free spirits from around the globe who want to explore their wild side. Bushy beards and colorful body art mingle freely with designer leather and fine jewelry. The common bond? Open road, man, open road.

Gateway Solo 2100 Portable PCs

Relax. The freedom of the new Gateway Solo™ 2100 multimedia notebook is yours. Based on the road-tested features of the Gateway Solo portable PC, Solo 2100 notebooks deliver all the features you want *and* need. Bigger screens, an all Pentium® processor-based lineup, zoomed video port, 6X CD-ROM drives and 16MB EDO RAM standard — for less. They start at $2,699. And because we know you're accustomed to free rein, all Gateway Solo 2100 multimedia notebooks are custom-built to your specifications. We've blazed new trails in portable computing — now you can too. Road warriors, call Gateway today!

intel inside pentium PROCESSOR

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Portable Sales

GATEWAY
More
BIG
Trends from
Gateway!
February 1988
The bovine species makes its debut in PC advertisements with Gateway's first national ad. Cows become cool.
July 1990
The stakes are raised in PC advertising. Gateway pioneers theme ads and easy-to-read bullet-point configurations with the "PC Saloon" ad.
April 1991
Gateway starts shipping PCs in cow-spotted boxes. Cow-spot fever spreads across the nation.
February 1992
PCs with the "works" become the standard, as Gateway offers choice of application software on new systems at no extra charge.

Quality That's EASY To Spot!

Gateway 2000 has been taking the guesswork out of buying PCs ever since our humble beginning in 1985. We give you all the information you need to find the right system. And great prices, quality products and outstanding service and support are the norm rather than the exception. We've also made your PC buying experience more fun by embracing our origins — Gateway was started by a couple farm boys in a barn on a Midwestern cattle ranch. In honor of these roots, 5,000 Gateway employees painted cow spots on our headquarters. No polished silver or mirrored glass here. That's not Gateway's style. After all, we were born in a barn.

Destination Big Screen PC

It's easy to spot the big trends with Gateway. Now after 11 years of rolling out some of the hottest trends around, we started a trend that will change the way you look at computers — forever. It's the Destination™ Big Screen PC. We've merged the features of a multimedia PC with the impact of a big screen TV to create a whole new computer category. The 31-inch monitor, wireless keyboard and Field Mouse® remote control harness the power of a Pentium® processor to give you the ultimate multimedia PC. Computing just moved to the family room. Pull up a couch. For the big picture, call Gateway today!

July 1994
The multimedia bonanza begins – CD-ROM drives become standard on all GATEWAY™ desktop systems.

intel inside pentium

GATEWAY2000

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888-888-0363

Multimedia Systems

P5-120 FAMILY PC™

- Intel® 120MHz Pentium® Processor
- 16MB EDO DRAM
- CrystalScan®15 .28dp Monitor (13.9" viewable)
- 1MB DRAM, 64-Bit PCI Graphics
- 1GB 10ms EIDE Hard Drive
- 8X CD-ROM/3.5" Diskette Drives
- 16-Bit GATEWAY™ Sound Card
- Altec™ Lansing ACS-40 Speakers
- TelePath® 28.8 Fax/Modem for Windows
- 7-Bay Mini Tower Case
- 104+ Keyboard & MS Mouse 2.0
- Microsoft® Windows® 95
- Generations II Software Collection

$1699

P5-166 FAMILY PC

- Intel 166MHz Pentium Processor
- 16MB EDO DRAM
- 256K Pipelined Burst Cache
- Vivitron™17 .26dp Monitor (15.9" viewable)
- 2MB DRAM, 64-Bit PCI Graphics
- 2GB 11ms EIDE Hard Drive
- 8X CD-ROM/3.5" Diskette Drives
- 16-Bit Gateway Sound Card
- Altec Lansing ACS-40 Speakers
- TelePath 28.8 Fax/Modem
- 7-Bay Mini Tower Case
- 104+ Keyboard & MS Mouse 2.0
- MS Windows 95
- Generations II Software Collection

$2449

P5-200 FAMILY PC

- Intel 200MHz Pentium Processor
- 32MB Synchronous DRAM
- 256K Pipelined Burst Cache
- Vivitron17 .26dp Monitor (15.9" viewable)
- Matrox® 2MB WRAM PCI Graphics
- 3GB 11ms EIDE Hard Drive
- 8X CD-ROM/3.5" Diskette Drives
- 16-Bit Gateway Sound Card
- Altec ACS-40 & ACS-250 Speakers
- TelePath 28.8 Fax/Modem
- 12-Bay Tower Case
- 104+ Keyboard & MS Mouse 2.0
- MS Windows 95
- Generations II Software Collection

$2999

G6-200XL

- Intel 200MHz Pentium Pro Processor
- 32MB EDO DRAM
- 256K Internal Cache
- Vivitron17 .26dp Monitor (15.9" viewable)
- Matrox 2MB WRAM PCI Graphics
- 3GB 11ms EIDE Hard Drive
- 8X CD-ROM/3.5" Diskette Drives
- ▸ CD-Recordable w/ SCSI Controller
- 16-Bit Ensoniq® Wavetable Sound Ca
- Altec ACS-400 & ACS-250 Speakers
- TelePath 28.8 Fax/Modem
- 12-Bay Tower Case
- 104+ Keyboard & MS Mouse 2.0
- MS Windows 95
- MS Office 95, Professional Edition
- Generations II Software Collectio

$3899 Business Lease† $143/

Professional Systems

P5-133

- Intel 133MHz Pentium Processor
- 16MB Synchronous DRAM
- 256K Pipelined Burst Cache
- Vivitron15 .26dp Monitor (13.9" viewable)
- 1MB DRAM, 64-Bit PCI Graphics
- 1GB 10ms EIDE Hard Drive
- 8X CD-ROM/3.5" Diskette Drives
- 7-Bay Mini Tower Case
- 104+ Keyboard & MS Mouse 2.0
- MS Windows 95
- MS Office 95, Professional Edition

$1699 Business Lease† $63/mo.

P5-166

- Intel 166MHz Pentium Processor
- 16MB Synchronous DRAM
- 256K Pipelined Burst Cache
- Vivitron17 .26dp Monitor (15.9" viewable)
- 2MB MDRAM, 128-Bit PCI Graphics
- 2GB 11ms EIDE Hard Drive
- 8X CD-ROM/3.5" Diskette Drives
- 12-Bay Tower Case
- 104+ Keyboard & MS Mouse 2.0
- MS Windows 95
- MS Office 95, Professional Edition

$2299 Business Lease† $85/mo.

P5-200

- Intel 200MHz Pentium Processor
- 32MB Synchronous DRAM
- 256K Pipelined Burst Cache
- Vivitron17 .26dp Monitor (15.9" viewable)
- 2MB MDRAM, 128-Bit PCI Graphics
- 3GB 11ms EIDE Hard Drive
- 8X CD-ROM/3.5" Diskette Drives
- 12-Bay Tower Case
- 104+ Keyboard & MS Mouse 2.0
- MS Windows 95
- MS Office 95, Professional Edition

$2699 Business Lease† $99/mo.

G6-180

- Intel 180MHz Pentium Pro Processor
- 32MB EDO DRAM
- 256K Internal Cache
- Vivitron17 .26dp Monitor (15.9" viewable)
- 2MB MDRAM, 128-Bit Graphics
- 3GB 11ms EIDE Hard Drive
- 8X CD-ROM/3.5" Diskette Drives
- 12-Bay Tower Case
- 104+ Keyboard & MS Mouse 2.0
- MS Windows 95
- MS Office 95, Professional Edition

$2699 Business Lease† $99/m

Gateway Solo™ 2100 Portable PCs

S5-100

- 11.3" DSTN SVGA Color Display
- Intel 100MHz Pentium Processor
- 16MB EDO DRAM expandable to 40MB
- 256K Pipelined Burst Cache
- 1MB EDO Video RAM
- Zoomed Video Port
- 540MB Hard Drive
- Modular 6X CD-ROM Drive
- Modular 3.5" Diskette Drive
- 16-Bit Sound & Stereo Speakers
- Lithium Ion Battery & AC Pack
- 85-Key MS Windows 95 Keyboard
- Carrying Case
- MS Windows 95
- MS Works 95

$2699 Business Lease† $99/mo.

S5-133

- 12.1" Active Matrix SVGA Color Display
- Intel 133MHz Pentium Processor
- 40MB EDO DRAM
- 256K Pipelined Burst Cache
- 1MB EDO Video RAM
- 1.2GB Hard Drive
- Modular 6X CD-ROM Drive
- Modular 3.5" Diskette Drive
- 16-Bit Sound & Stereo Speakers
- 28.8 PCMCIA Fax/Modem
- 2 Lithium Ion Batteries & AC Pack
- 85-Key MS Windows 95 Keyboard
- Carrying Case
- MS Windows 95
- MS Office 95, Professional Edition

$5449 Business Lease† $195/mo.

Destination™ Big Screen PCs

D5-166

- Intel 166MHz Pentium Processor
- 16MB EDO DRAM
- 256K Pipelined Burst Cache
- Destination 31" VGA monitor
- STB® 2MB VRAM Graphics Accelerator w/ Cable-Ready TV Tuner
- 2GB 11ms EIDE Hard Drive
- 8X CD-ROM/3.5" Diskette Drives
- 16-Bit Hi-Fi Wavetable Audio Card
- TelePath 28.8 Fax/Modem
- 7-Bay Charcoal-Colored PC Case
- Wireless Keyboard w/ Integrated EZ Pad™ Pointing Device
- Wireless Field Mouse® Remote
- Four-Channel RF Receiver
- MS Windows 95
- Destination Software Collection

$3899 Business Lease† $143/mo.

D5-200

- Intel 200MHz Pentium Processor
- 32MB Synchronous SDRAM
- 256K Pipelined Burst Cache
- Destination 31" VGA monitor
- STB 2MB VRAM Graphics Accelerat w/ Cable-Ready TV Tuner
- 3GB 11ms EIDE Hard Drive
- 8X CD-ROM/3.5" Diskette Drives
- 16-Bit Hi-Fi Wavetable Audio Card
- TelePath 28.8 Fax/Modem
- 7-Bay Charcoal-Colored PC Case
- Wireless Keyboard w/ Integrated EZ Pad™ Pointing Device
- Wireless Field Mouse® Remote
- Four-Channel RF Receiver
- MS Windows 95
- Destination Software Collection

$4399 Business Lease† $161/

intel inside pentium PROCESSOR

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International FaxBack Access 605-232-2561 • Component Add-On Sales 800-846-2080 • Sales Hours: 7am-10pm Weekdays, 9am-4pm Saturdays (CDT)

Trend-Setting EXTRAS!

Multimedia/Storage

- **Altec™ Lansing ACS-250 Subwoofer $75**
  (upgrade from PCs that include Altec ACS-40 speakers)
- **Altec ACS-400 Speaker System w/ ACS-250 Subwoofer $120**
  (upgrade from PCs that include Altec ACS-40 speakers)
- **Iomega® Ditto™ 3200 Internal Tape Backup Unit $199**
  3200MB with compression, nominal 1600MB

Networking

3Com® Ethernet Adapters

- 16-Bit Triple Media Card with BNC, AUI and RJ-45 Connectors $99
- 16-Bit Card with only RJ-45 Connector $79

Software

- **Kid's BackPack™ III**
  Includes School House Rock!™: Grammar Rock™; Sesame Street: Get Set to Learn®; Math Blaster 2®: Secret of the Lost City; Imo & The King™; Putt-Putt® Goes To The Moon™; and Gateway cow-spotted backpack. $59
- **Finance Pack** *(U.S. Shipment Only)*
  Includes Quicken® Deluxe 5, Quicken Financial Planner,™ Quicken Family Lawyer,™ and Quicken Parents' Guide To Money.™ $69

Printers, Scanners & Digital Cameras

- Epson® Stylus™ Color IIs Ink Jet Printer $199
- Epson Stylus Color II Ink Jet Printer $279
- Epson Stylus Pro Printer $449
- Hewlett®-Packard LaserJet 5L Xtra Printer $479
- Hewlett-Packard LaserJet 5P Printer $849
- Epson Action Scanning™ System II $449
- Epson Photo PC Digital Camera $499

Service & Support

Gateway Gold™ Premium for Desktop Systems

- Extended Three-Year On-Site Agreement*
- Priority 800 Number For Access to Technical Experts
  With system purchase $99
  Within current on-site service agreement $129

Ask about Gateway Gold Premium upgrade for the Destination™ Big Screen PC.

**On-site service for desktop and tower systems is available to most U.S. and Canadian locations after determination by a Gateway tech that you need it. On-site service is provided by PC Technology Services, Inc. Write or call for a free copy of the on-site service agreement.*

Gateway accepts most major credit cards and C.O.D. terms, with net 30-day terms and leasing options available to qualified commercial customers. You can also apply for the Gateway 2000 DuoLine™ MasterCard® card, issued by Dial National Bank, Des Moines, Iowa.

Destination Big Screen PC Option

- **harman/kardon High-Fidelity Sound System**
  Seven-piece Dolby® Surround Sound Pro Logic speaker system including AVR-10 audio/video receiver with remote, subwoofer, center channel, and four satellites for the ultimate multimedia audio experience. $699

Call the GATEWAY™ component add-ons division at 800-846-2080 for our complete line of extras for Gateway customers. Sales Hours: 7am-10pm Weekdays (CDT).

GSA Schedule # GS-35F-3349D

REGISTERED COMPANY ISO 9002 SGS

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NEW PRODUCTS

Pentium Power Mac Box Lacks Processing Power

THE PENTIUM'S SLUGGISH performance detracts from the overall appeal of this double-duty Power Macintosh/PC system.

DESKTOP

MEET THE FIRST Macintosh to come with a built-in Pentium processor card—the **Power Macintosh 7200/120 PC Compatible**: It lets you hedge your bets when buying an Apple computer. In one box, you've got both a fully configured, 120-MHz PowerPC 601 Mac and a 100-MHz Pentium processor. The Pentium chip resides on Apple's PC Compatibility Card, a preinstalled PCI expansion card.

To switch between operating systems, just press <Return> and Apple's famous <Command> key together. You can even plug two monitors into the back of the Power Mac, displaying the Mac desktop on one and Windows on the other—a real convenience for cutting and pasting between the two operating system's clipboards. The Pentium and PowerPC processors work independently of one another, so you can, for instance, watch a video from a Windows 95 CD-ROM while writing in a Mac word processor.

Even better, Apple's $2799 street price is eminently reasonable. The price doesn't include a monitor, keyboard, or Windows software; adding those brings the cost to about $3500. But you'd spend about $4600 for a fully configured Power Mac and a separate Pentium system equivalent to Apple's PowerPC-Pentium hybrid.

Two computers in one box, at a compelling price—what's not to like? Performance, for one. Based on the results of our PC WorldBench tests on a preproduction Power Mac 7200/120, we found, on average, that the computer was about 50 percent slower than 100-MHz Pentium systems with 8MB of RAM. On the Power Mac, Windows applications and files are stored in a DOS-compatible file—effectively a partition on the hard drive. This probably accounts for the slower speed.

Second, there are differences between the Windows and Mac cultures. For instance, Windows systems ship with a two-button mouse, but the Power Mac comes with the standard one-button Mac mouse. Apple's work-around was to program the <Equal> key on the Power Mac keyboard's numeric keypad to perform the same duties as a right mouse button. But hit the <Equal> key in the numeric keypad, and you get the pop-up Windows menu instead of a tabulation.

Is Apple's dual-personality machine a good choice for Windows users? In most cases, probably not: PC users must make too many compromises. But for Mac users who need to run Windows software regularly, the Power Macintosh 7200/120 PC Compatible makes sense.

—*James A. Martin*

Power Macintosh 7200/120 PC Compatible

PRO: Mac with a Pentium chip.

CON: Pentium underperforms.

Apple Computer

408/996-1010

Street price: $2799

READER SERVICE NO. 768

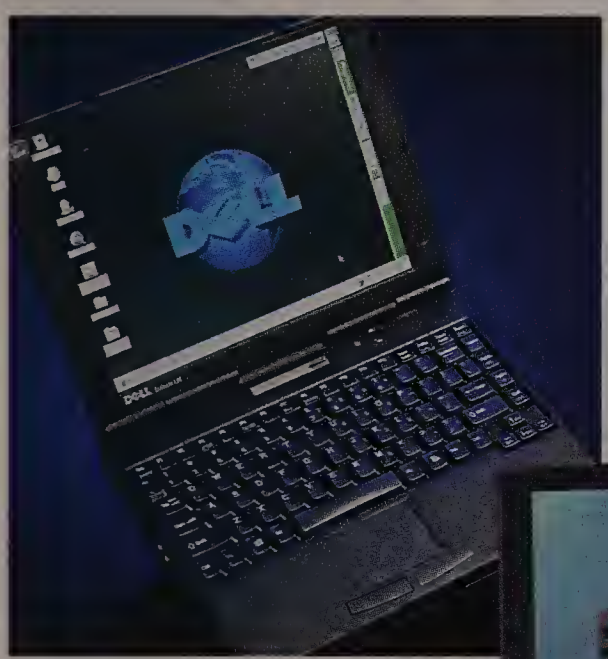
JOHN GREENLEIGH

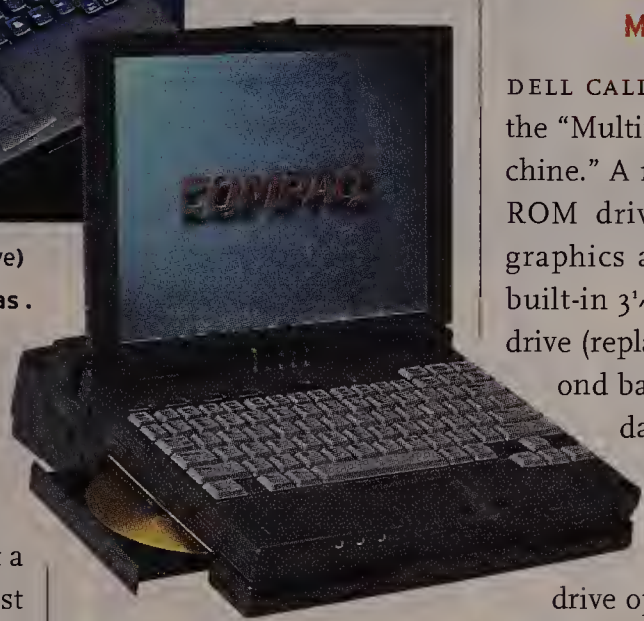
Dell, Compaq Notebooks Go Modular

NOTEBOOK

THE LATEST GENERATION of high-end notebooks offers desktop-level power, longer battery life, and better screens, all for lower prices than just a few months ago. The biggest news, though, is that these notebooks are completely modular. But configuring one can be as confusing as selecting options for your car.

The **Compaq Armada 4100** and **Dell Latitude LM** are similar in many ways, but they meet different needs. The Compaq is designed for on-the-go users who want maximum power and minimum weight; the Dell is aimed at those who want full multimedia capabilities. High-end Pentium processors are the norm for each. The Compaq is available with a 100-, 120-, or 133-MHz Pentium processor; Dell offers a P100- or P133-MHz CPU. Both of them use lithium ion batteries, have standard ports including PC Card slots, and have integrated audio.





THE DELL LATITUDE LM (above) is loaded with multimedia extras. The speedy Compaq Armada (right) is available in models ranging from 4.8 pounds (basic) to 7 pounds (loaded).

COMPACT FLEXIBILITY

THE ARMADA 4100 notebooks from Compaq have an ultraflexible base design and a wide variety of configurations. If you're looking for the lowest traveling size and weight, the basic Armada is just 1½ inches thick and 4.8 pounds (sans the external 3½-inch floppy disk drive). Slip a battery in the bay that's cleverly part of the notebook's handle, though, and the notebook's weight goes up to 5.1 pounds. You can keep adding features, including a snap-on 4X CD-ROM drive with a second battery bay, but you'll also add an extra half-inch to the height and up the weight to nearly 7 pounds.

The Armada comes with a center-mounted touchpad pointing device, but you can replace the pad with a trackball. You can select an 810MB or 1.08GB hard disk.

Our tests on the top-of-the-line 133-MHz Armada 4100 (with a big 11.8-inch TFT active-matrix screen) found it an impressive performer, chalking up an overall PC WorldBench score of 180 (versus an average of 153 for other 133-MHz systems). It shined in the application tests as well.

DELL MULTIMEDIA MACHINE

DELL CALLS ITS Latitude LM the "Multimedia Dream Machine." A removable 4X CD-ROM drive, a 128-bit PCI graphics accelerator, and a built-in 3½-inch floppy disk drive (replaceable with a second battery) are all standard. The Latitude is 2 inches thick and weighs about 7 pounds. Hard drive options are 540MB, 810MB, and 1.3GB.

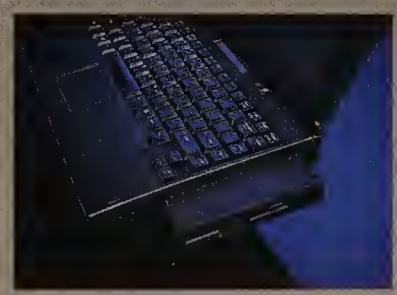
We looked the P-133 Latitude with a 12.1 TFT screen that offers 800 by 600 resolution at 256 colors (Compaq offers 65,000 colors). Our tests showed it to be an average performer, with an overall PC WorldBench score of 141, compared to an average of 143.

The Armada's the logical choice for great performance and portability, but if you want the goodies all at once, the Latitude's the better choice.

—*Stan Miastkowski* ▶

Compaq Armada 4100

PRO: Impressive performance.
CON: Adding components drives up overall price.
Compaq Computer Corp.
800/345-1518
http://www.compaq.com
Street price: $2599 to $4599
READER SERVICE NO. 769



Dell Latitude LM

PRO: Loaded multimedia portable.
CON: Average system performance.
Dell Computer Corp.
800/289-3355
Street price: $2399 to $3199
READER SERVICE NO. 770

EDITED BY
Laurianne McLaughlin and Gabrielle Mitchell

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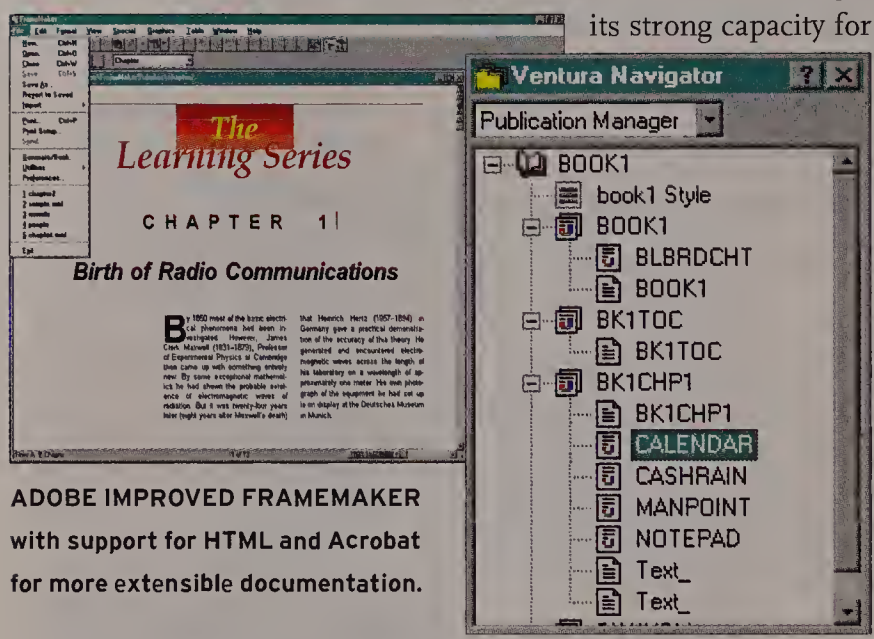
INTERNET

FOR MORE PRODUCT news and the latest announcements, check out the PC World Daily News Service at **http://www.pcworld.com/news.html.**

FrameMaker 5 and Ventura 7: Desktop Publishing Features Online Output

GRAPHICS

WHAT DO YOU GET when huge companies merge desktop publishing software with their well-known product lines? With **Adobe FrameMaker 5 for Windows 95** and **Corel Ventura 7**, you get powerful programs plus compatibility with other products in the families, such as Adobe Photoshop and CorelDraw. These updated FrameMaker and Ventura versions also have new features for online publishing.



ADOBE IMPROVED FRAMEMAKER with support for HTML and Acrobat for more extensible documentation.

VENTURA'S NAVIGATOR looks and works like Windows 95 for improved file management.

FrameMaker 5 for Windows 95 is the first release of the program since Adobe Systems acquired Frame Technology: Adobe has improved an already good product. Among the new features in version 5 are compatibility with Windows NT 3.51 (and higher) and Windows 95 capabilities such as support for long file names. But one of the best reasons to choose FrameMaker is to get its strong capacity for online document creation and distribution. The program includes Adobe Acrobat and HTML support.

In FrameMaker 5 for Windows 95, the extensive documentation guides you through building a Web site complete with graphics, hypertext links, and pop-up menus. There's new support for Object Linking and Embedding 2.0. You can embed video and sound files by copying the file to the clipboard and using the Paste Special command. You can also edit embedded or linked objects, such as sound files. You can't embed QuickTime movies, though, as you can with the Macintosh version of FrameMaker 5.

Like FrameMaker 5, Corel Ventura 7 works well for creating long documents and online documents. Earlier versions of Ventura were criticized for lacking management and navigation controls; version 7 addresses that criticism with two new tools: Navigator looks and works like the Windows 95 Explorer; Library is a file window that lets you view all files related to a document. You can drag and drop the files to modify documents.

Also like FrameMaker 5, Ventura 7 lets you add hypertext links, sound, and video files to your document. But Ventura 7 offers a bit more flexibility and a few extra features: You can publish Java, Common Ground, and Envoy (Acrobat-like) documents. Java format, for example, lets you use pop-up windows, multiple fonts, and more in your online documents. Ventura 7 also comes with WordPerfect SGML so you can work with SGML documents or import them into Ventura 7. QuickTime movies? No sweat, Ventura does those too. CD-ROM publishing? Corel says it will bundle Corel CD Creator with Ventura 7, although it wasn't available with the beta version.

But make sure you've got room on your hard drive. Fully installed, Ventura 7 takes a whopping 140MB, compared to the mere 20MB to 30MB that FrameMaker 5 occupies.

—Anne Fischer Lent ▶

Adobe FrameMaker 5 for Windows 95

PRO: Flexible and easy to use.
CON: Can't embed QuickTime movies.
Adobe Systems, Inc.
415/961-4400
http://www.adobe.com
List price: $895; $225 upgrade for FrameMaker 4, $59 upgrade for version 5 for Windows 3.1
READER SERVICE NO. 771

Corel Ventura 7

PRO: Impressive online help.
CON: Hogs 140MB of hard disk space.
Corel Corp.
800/772-6735, 613/728-8200
http://www.corel.com
Pricing: $895; $249 upgrade for Quark, PageMaker, or WordPerfect users who upgrade to Corel suites
READER SERVICE NO. 772

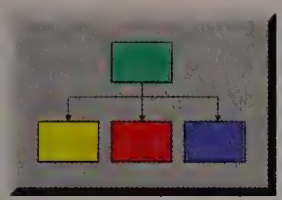
QUICK TAKES

Web Site Creator to Avoid

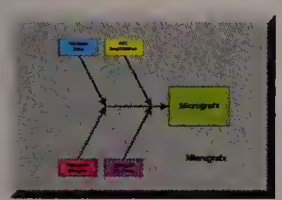
You don't need to know HTML to create a Web site using THISoftware's WebSite Director 1.1, but you may need considerable patience. **WebSite Director 1.1** generates formatted and hyperlinked HTML pages after you fill in templates. We used a beta version of Director, which had a few problems. For example, we received an error message when we tried to activate the built-in HTML editor and insert an image. The company says the problem has been resolved in the shipping version. WebSite Director has some useful features, but we didn't like the interface. The $149 program runs with Windows 3.1 and 95. THISoftware, 713/785-4357.
READER SERVICE NO. 782

Get the Picture

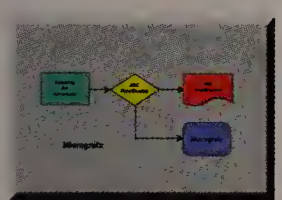
In search of the perfect clip art in a hurry? PhotoDisc may have just what you're looking for at **www.photodisc.com**. PhotoDisc is widely recognized for providing royalty-free digital images on CD-ROM. But it offers more than 20,000 images at its Web site—and hundreds of new pieces of art are added weekly. You can download an image for a fee of between $9.95 and $89.95, depending on its size. By year's end, according to the vendor, you should be able to access up to 150GB of images. PhotoDisc, http://www.photodisc.com.
READER SERVICE NO. 783



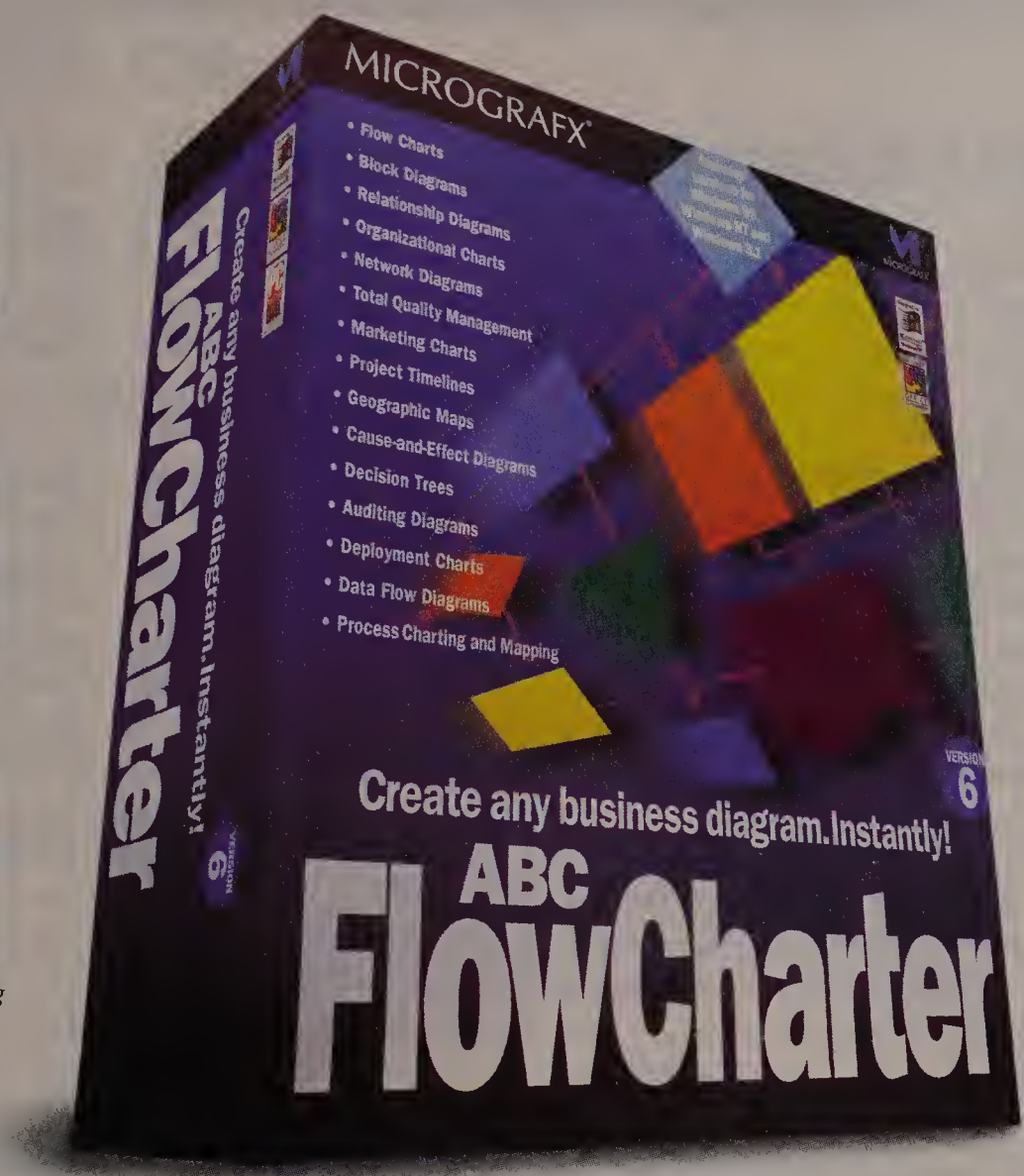
Human resource tools like organization charts and relationship diagrams

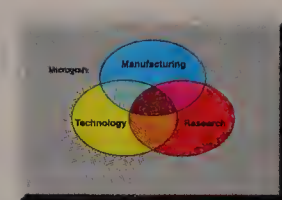


Management support diagrams like cause & effect, decision trees and timelines

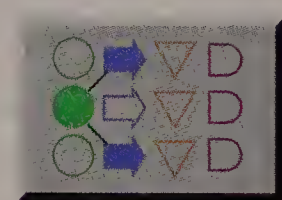


Business process re-engineering diagrams like flow charts, and data flow diagrams





Marketing tools like venn diagrams, targets, pyramids and geographic diagrams



Total quality management diagrams like process charts and maps

IT and software design tools like network diagrams and object oriented design diagrams

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New Lexmark Printouts Even Look Good Wet

PRINTER

THERE'S A NEW PRICE leader in the color ink jet market: Lexmark's **Color Jetprinter 2050** sells for street price of $299—less than HP's $309 DeskJet 680C and Canon's $329 BJC-4100 ink jet printers. What's more, it's the first Lexmark to use a new waterproof ink. We tested a shipping unit, and the output passed the water test. A mixed color and text page that we placed under running tap water for one full minute did not run or smear, even with some gentle rubbing.

Lexmark's 2050 provides 600-by-600-dots-per-inch resolution, for a price that's $120 more than the 600-by-300-dpi Lexmark Jetprinter 1020. For small business or home use, the Jetprinter 2050 works quickly enough, with rated print speeds of 4 pages per minute for monochrome and 1 page per minute for color. You can print draft-quality pages at 5 ppm for monochrome and 2 ppm for color.

The 2050's text and color print quality look very good, as we have come to expect from Lexmark. We found that continuous tone images, such as scanned photographs, print particularly well.

Lexmark's bundled Workshop CD-ROM has changed significantly, as well. In addition to showing you how to install and configure your printer, Lexmark's Workshop lets you print T-shirt transfers, greeting cards, certificates, labels, and envelopes. Lexmark also provides Comic Creator, which lets you make custom comic books using characters, props, and scenery provided—perfect for the next birthday in your office. Finally, Netscape Navigator 2.0 is also included so you can connect to the Internet.

Lexmark has launched a line of specialty media for all ink jet printers; for a limited time, a free sample pack is available by calling Lexmark Direct at 800/438-2468.

—Bill Underwood

Lexmark Color Jetprinter 2050

PRO: Inexpensive ink jet produces waterproof pages.

CON: None.

Lexmark International, Inc.

800/891-0331

http://www.lexmark.com

Street price: $299

READER SERVICE NO. 773

QUICK TAKES

Okidata's Printer Deal

An affordable option for students or the home office, Okidata's new low-price **Okipage 4w** ink jet printer provides good print quality and excellent speed, according to our informal tests. Offering 600-dpi resolution and 4-pages-per-minute output, the model provides laser-quality monochrome printing for about $299. Sure, you can buy a color ink jet printer in the same price range, but you may not want to pay for the color cartridges or put up with the slower monochrome print speeds common with color printers. The Okipage 4w comes with a 100-sheet paper tray and 128K of memory—nothing fancy, but you can't argue with the price. This basic but serviceable ink jet printer is also Plug and Play compatible with Windows 95. Okidata, 800/654-3282, http://www.okidata.com.

READER SERVICE NO. 784

Plustek's $369 OpticPro: Solid Scanner

SCANNER

PLUSTEK'S NEWEST color flatbed scanner provides two main benefits: a low price and a simple setup. With a street price of $369, Plustek's **OpticPro 4800P** is one of the least expensive full-color flatbed scanners available. It scans images in 24-bit color and gray-scale modes at a native resolution of 300 by 600 dpi and supports up to 4800 dpi with software interpolation. As for installation, the scanner connects easily to your PC through the parallel port. While scanners connected via SCSI interfaces work fastest, this Plustek unit performed well in our informal tests. It took us about 90 seconds to scan a 4-by-5-inch color photo. The OpticPro 4800P offers enough quality and speed for typical business uses such as scanning photos for newsletters, reports, or brochures.

This TWAIN-compatible scanner comes with both 16-bit (Windows 3.1) and 32-bit (Windows 95) drivers. To help you manage documents, there is an Action Manager program with fax and copy utilities. Plustek also bundles Recognita Plus OCR software for editing scanned text, and Image-In, a photo editing application.

Notwithstanding its rock-bottom price, the 4800P has a number of useful features that make it a good match for the small office/home office. For example, a clever sliding cover hinge makes it easy to scan extra-thick originals such as a book. And the long-life cold-cathode tube automatically turns off when it's inactive.

—Stan Miastkowski ▶

PLUSTEK'S OPTICPRO 4800P SCANNER hooks up to the parallel port, which makes installation hassle-free.

Plustek OpticPro 4800P Scanner

PRO: Low-price scanner installs easily via the parallel port.

CON: Trade-off is slow color scans.

Plustek USA

800/685-8088, 408/745-7111

http://www.plustek.com

Street price: $369

READER SERVICE NO. 774

Other 2D Drawing Tools	Imagineer™ Technical
Click Click	Click
<Esc> @10,20	Click
Click Click	Click
Click <Esc>	Click
#@!? Redraw	Click
Click <Tab>	
<Tab> 14.3	
Click <Esc>	
Click + Drag	
Crash #@!?	

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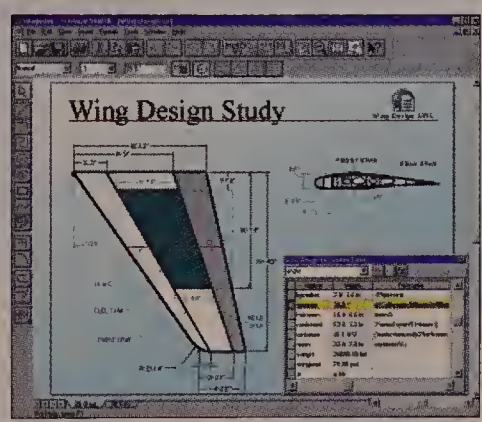

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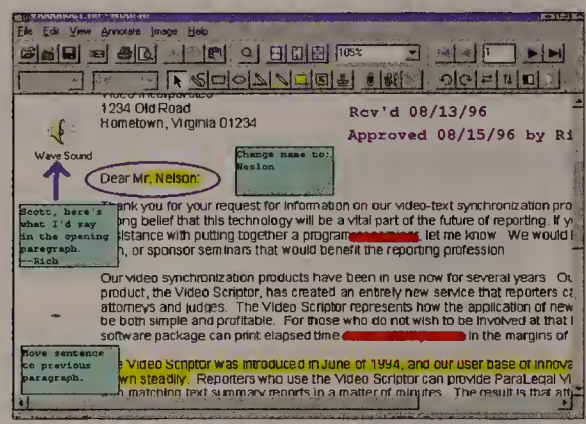
Circle 106 on reader service card

Annotate Workgroup Documents With Ease

UTILITY

GIGATRON SOFTWARE'S **Note It**, a 32-bit Windows 95 or Windows NT program, features more than just the electronic equivalent of Post-it sticky notes. It also has a useful and easy set of markup tools—including highlights; time, date, and user stamps; and drawing and writing pens—that you and your workgroup can use to annotate documents you share from graphics, word processing, Internet (HTML), fax, and spreadsheet and other file formats.



NOTE IT ANNOTATES documents and images with sticky notes, highlights, and other tools.

Note It keeps all annotations separate from the document being marked up, so the original is always intact. Although Note It is MAPI mail-enabled and network ready, it is not designed to compete with Lotus Notes and other heavyweight programs for team computing. If you don't need high-powered collaboration tools, the $99 Note It is an efficient and affordable utility for any office that shares files.

—*Richard Jantz*

Note It

PRO: Affordable workgroup app.

CON: Not for complex projects.

Gigatron Software Corp.

800/909-9199, 714/261-1777

List price: $99

READER SERVICE NO. 775

Act and Organizer: First Win 95 Versions

PIM

IT TOOK SOME TIME, but Symantec has finally released a 32-bit version of **Act**. And version 3.0 for Windows 95 and NT was worth the wait.

Act 3.0 for Windows 95/NT

PRO: Improved links to common apps; database synchronization.

CON: None

Symantec Corp.

800/441-7234

http://www.symantec.com

Street price: $199

READER SERVICE NO. 776

Lotus Organizer 97

PRO: Windows 95 look and feel.

CON: Not worth the upgrade.

Lotus Development Corp.

800/343-5414

http://www.lotus.com

Street price: $79, upgrade $49

READER SERVICE NO. 777

Lotus has shipped **Organizer 97**, the first 32-bit version of its veteran personal information manager. However, Organizer 97 provides only minute functional enhancements.

For people working in sales or consulting, Symantec's Act contact manager is worth its $199 street price because it tracks hundreds of names, letters, calls, and date- and time-stamped notes. The program also generates custom reports, which are useful for showing clients or the boss how hard you're working. Act not only does more than most other PIM programs, it offers more customization options.

Among the best new features: Act 3.0 provides better links to word processors such as WordPerfect and Microsoft Word, plus the capability to attach letters and files to contact names. You'll find wizards that speed up work, as well as flexible new views for contact and to-do lists. Workgroups can share contact and calendar information, and track projects. Act 3.0 also delivers database synchronization features for mobile users.

As for Lotus Organizer 97, it has a Windows 95 look and feel with some minor feature changes. You'll find tweaks to the calendar (daily views now show the duration of appointments) and the notepad section (you can use OLE 2.0 to create document links). For existing users, these small improvements may not be worth the $49 upgrade.

—*Laurianne McLaughlin* ▶

QUICK TAKES

New and Improved: PCAnywhere

Symantec's **PCAnywhere32 version 7.5** is a remote control/remote access program for Windows 95 and NT. It offers added flexibility as a 32-bit application. New features include expanded Internet connection capabilities and support for both ISDN and infrared links. The handy new AutoXfer utility gives you the capability to transfer and synchronize files between PCs automatically, as soon as you make a connection. In addition, Symantec claims improved performance due to the larger cache file. New multitasking tools let you do both remote control and file transfer at the same time. The estimated street price for a host-and-remote (two-user) package is $149. A competitive upgrade is available for $79.95. Symantec Corp., Delrina Group, 800/441-7234, 541/334-6054, http://www .symantec.com.

READER SERVICE NO. 785

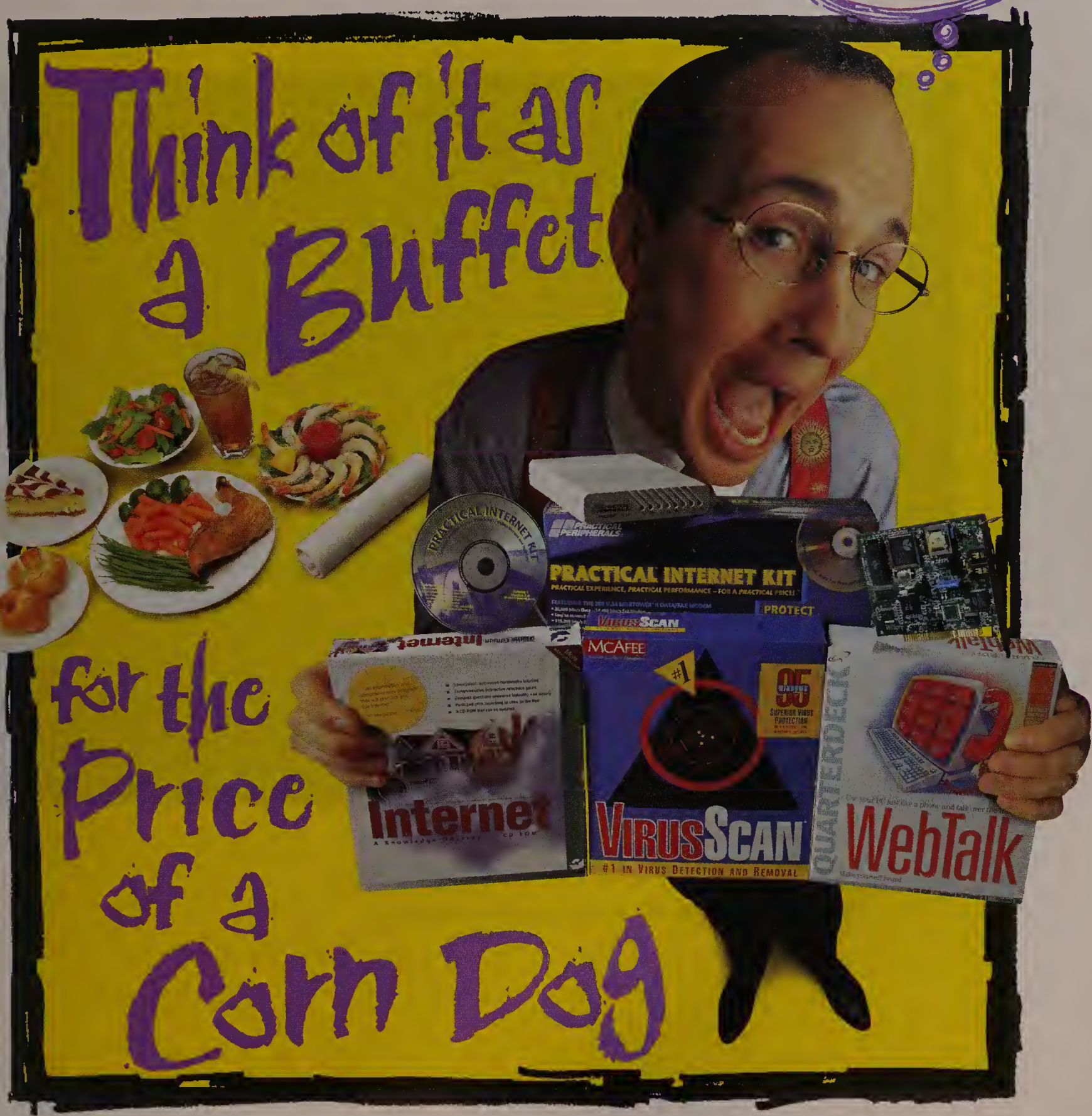
Notebook Telephony Wizard

Connectware's **PhoneWorks 28.8 to Go PC Card** looks like your ordinary Type II 28.8 fax-modem card, but the headphones that come with it should tell you it does a little more than the average PC Card modem. This $299 product offers a spate of useful telephony functions: It supports as many as 10 voice mailboxes with individual greetings, hands-free calling, links to your pager, fax on demand, and broadcast faxing. The card also works with caller ID service, though you must be at home for those features to work. This unusual PC Card modem will serve you well. Connectware, Inc., 800/357-0852.

READER SERVICE NO. 786

Introducing The Practical Internet Kit.

AT $129 INTERNAL AND $149 EXTERNAL
WHAT A VALUE!



The Practical Internet Kit is the first *complete* Internet Kit to provide you with the necessary tools to fully experience, work, and enjoy the Internet. The Kit features the Practical Class 288 V.34 Data/Fax modem (upgradeable to 33.6) and an outstanding array of CD-ROM-based software. LEARN about the Internet off-line with MindQ's tutorial. ACCESS the Internet through a variety of leading service providers and web browsers including Netcom Access Kit containing Netscape Navigator™ Internet client. TALK on the Internet via Quarterdeck® WebTalk.™* PROTECT data integrity from viruses on the Internet with McAfee's VirusScan.™ The Practical Internet Kit ships with Quicklink™ II Data/Fax software, and is backed by 7 day technical support and a lifetime limited warranty. It's even Windows NT compatible. What a value! For more info, call 800-964-2937, ext. 290 or use PRACTIFAX at 800-225-4774 and select document 4005.

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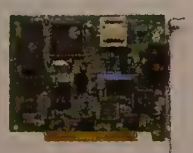

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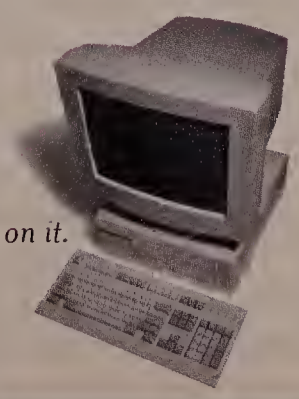

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IDE Hard Drives Break the 2GB Barrier

STORAGE

HAVE YOU RECENTLY examined the contents of your IDE hard drive and found yourself feeling a tad claustrophobic? Chances are you've outgrown your current hard drive and need to upgrade to something roomier. Luckily, hard disk manufacturers are bringing out larger-capacity drives without inflating the price.

For an example of this, look at Western Digital's Caviar 31600, a 1.6GB drive that cost $699 initially. This year's model, the **Caviar AC32500**, is a spacious 2.5GB drive that sells for just $399. Not only do you get more room for your dollar, but you don't have to throw your old drive in the trash if you decide to upgrade. Many motherboards now support two or more IDE peripherals. When you buy a new drive, simply use the old one as a backup for important documents or as storage for files that are too large to keep on the main drive.

We examined and tested five new giant hard drives—Western Digital's Caviar AC32500, IBM's **DeskStar 3**, Seagate's **Medalist 2140**, the Quantum **Big Foot**, and the **SureStore 2000A** from Hewlett-Packard. (HP announced at press time that it would discontinue manufacturing disk drives by the end of the year.) We attached each drive to a Micron P100 Millennia with 16MB of RAM and formatted it as the primary C: drive. IBM's 2GB Deskstar 3 was the fastest drive across the board in our tests. But it was shadowed by Seagate's 2.1GB Medalist 2140. Third and fourth places went to Quantum's 2GB Big Foot and Western Digital's Caviar AC32500, respectively, while HP's 2GB SureStore 2000A finished a close fifth.

IBM'S BIG 2GB DESKSTAR 3 drive was the fastest of the five hard drives we reviewed.

BIOS LIMITATIONS

BEFORE YOU RUSH off to buy a new drive, we must tell you that possible conflicts exist between drives larger than 2.1GB and many BIOSes created between 1992 and February 1996. We've found three: First, the BIOS recognizes a maximum of 2.113GB; any additional storage on large drives is inaccessible. Second, BIOS conflicts could render useless as much as 2.1GB of your brand-new hard drive. Third (and nastiest), your PC may freeze after booting.

The good news is that BIOS manufacturers are aware of the problem and have corrected it. New systems shipping today should not be affected. If your system uses flash BIOS or a user-programmable BIOS chip, you can upgrade it (but contact your system manufacturer before attempting this operation). If you have a nonflash or nonprogrammable BIOS, you'll need a ROM chip upgrade from your system manufacturer. Or if your new 2GB-size disk isn't letting you access all of its sectors, you might want to buy EZ-Drive, a software utility from Micro House International (800/926-8299) that lets you take advantage of the drive's remaining space. But this product doesn't work if your computer is freezing up upon booting.

—Richard Popko ▶

2GB IDE Drives

PRO: Big hard drives, little prices.
CON: Can have BIOS conflicts.

Caviar AC32500
Western Digital
800/832-4778
List price: $399
READER SERVICE NO. 778

Deskstar 3
IBM
800/426-3333
List price: $399
READER SERVICE NO. 779

Medalist 2140
Seagate
408/438-8111
Street price: $329
READER SERVICE NO. 779

Quantum Big Foot
Quantum
800/624-5545
Street price: $300
READER SERVICE NO. 780

SureStore 2000A
Hewlett-Packard
800/826-4111
Street price: $295
READER SERVICE NO. 781

QUICK TAKES

Use TV as PC Monitor

Some people have a new, bigger monitor right under their noses, and they don't even know it. With AITech's $249 **VSPro V64** video card inside your PC, you can hook up to a TV in order to enhance viewing of 3-D games, MPEG movies, or video conferences. (The PC hooks up to the TV as a VCR does, and a cable is included.) The card's scan converter lets the TV understand your PC's signals and uses AITech's Flic-Free technology to make the picture stable. The card comes with 1MB of DRAM upgradable to 4MB. The only major drawback is that the VSPro V64 also acts as your graphics card, so if you've already got a great graphics board, this product's not for you. Instead, opt for one of the external, pocket-size scan converters currently on the market. AITech Int'l, 800/882-8184.

READER SERVICE NO. 788

Portable Hard Drives

Your coworker asks you for a very large file. No problem: You just hand over your hard drive. The **KanguruDock** hard drive docking bay lets you pass around an enhanced IDE hard drive much as you would a floppy disk. Available in both an internal 5¼-inch version and an external version that connects via a parallel port, the docking bay accepts KanguruDisks that hold from a hefty 850MB ($339) to a whopping 2.5GB ($699) of data. And KanguruDocks are reasonably priced: List price is $59.95 for the internal bay, $79.95 for the external model. A SCSI version is in the works, according to the vendor. Interactive Media Corp., 508/429-9070, http://www.kanguru.com.

READER SERVICE NO. 789

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Circle 6 on reader service card

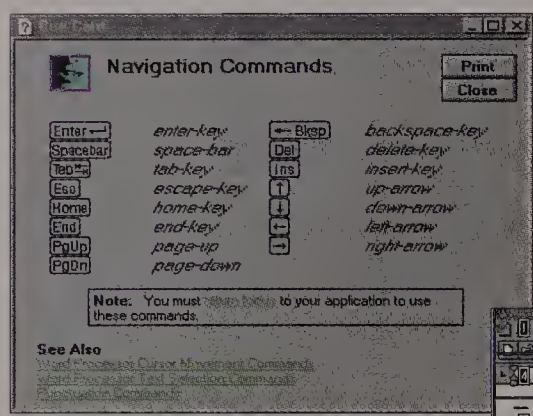
Dictation Software: Improved, but Not Perfect

INPUT

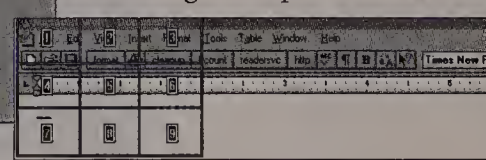
SINCE OUR LAST LOOK at dictation software ("What You Say Is What You Get?" January 1995), a lot has changed, but some things remain the same.

In just under two years, these products, which let you enter text and data into your PC verbally, have dropped about $300 while becoming more powerful. But after examining new Windows 95 versions from the category leaders, we found they are still a tad tricky to learn and use, and with prices at about $700 they are still not optimum replacements for your keyboard and mouse.

The input software is designed to let you dictate your way through applications such as those included in the major suites from Microsoft, Lotus, and Corel. Though installation was generally easy, learning to perform basic tasks took as long as 2 hours. But from that point, the products generally handled word processing tasks with aplomb: We were dictating simple sentences at up to 60 words per minute with minimal errors.



CALL FOR HELP: The Cue Card produces a list of possible commands.



VOICE MOUSE: Dragon's Mouse Grid feature lets you direct the cursor more accurately via numbered regions.

Like their predecessors, these products offer navigation features that let you bark commands in order to perform tasks that typically require a mouse, such as opening menus or moving the cursor. Still, in informal tests with cc:Mail and Excel, we found the products tricky to use. (They include macro features that can simplify navigation tasks.)

DragonDictate 2.5 for Windows

PRO: Navigation features can duplicate mouse movements.

CON: Errors are difficult to correct.

Dragon Systems Inc.

800/825-5897

List price: $695

READER SERVICE NO. 819

Kurzweil Voice Release 2.0 for Windows

PRO: Modeless dictation and navigation facilitate many tasks.

CON: Confuses commands with text input.

Kurzweil Applied Intelligence

800/380-1234

List price: $695

READER SERVICE NO. 820

VoiceType 3.0 for Windows 95

PRO: Allows more natural dictation.

CON: Demands a lot of hardware and patience.

IBM

800/825-5263

List price: $699

CATEGORY LEADERS

DragonDictate 2.5 for Windows was the easiest to install, learn, and use (we saw a beta version). New users will appreciate the short on-screen instructions for correcting words it fails to recognize. (Making corrections is critical when using dictation products because the process teaches the software to recognize a word the next time it hears it.)

DragonDictate also includes some unique navigation features. The on-screen Mouse Grid makes it easy to maneuver the pointer. The Grid divides the screen into numbered areas. This feature let us easily compose and respond to e-mail in cc:Mail version 2.0 for Windows, something that was more difficult with the others.

Like Kurzweil Voice, DragonDictate learns to recognize a mistaken word only if you stop dictating and correct the error. (You can dictate without stopping and correct mistakes later, but you lose the chance to "train" the software.)

Kurzweil Voice Release 2.0 for Windows (we saw a shipping version) integrates navigation and dictation into a single mode, so you can dictate text, issue a command to move the cursor, for instance, and then go back to dictating. Because of this facility, it was the best product for entering data into a spreadsheet. It's also the only one in its price category that can recognize up to 40,000 words right out of the box. (But it's a memory hog, requiring 16MB of RAM on top of what your operating system requires.) On the downside, the software sometimes confused navigation commands with text we entered.

We had mixed feelings about IBM's **VoiceType 3.0**. In our informal testing of a shipping copy, it was the fastest and most accurate. It also lets you dictate an entire document—completing your thoughts without interruption—then go back and make corrections that train the software to recognize problem words. However, it was the toughest to install and learn. We had to call tech support just to get the microphone working. In addition, VoiceType has the stiffest hardware requirements: IBM recommends a 90-MHz Pentium and 256K of secondary cache. The other products ran fine on our 75-MHz Pentium system.

All the products claim to work with 16-bit Sound Blaster–compatible sound cards.

—*Randy Ross* ▶

QUICK TAKES

PIM With a World View

Most personal information managers don't go on holiday. Almanac does, though—in both Gregorian and Jewish calendar mode. This $39.95 shareware application with scheduler, phone book, and to-do list uses a monthly calendar view as its home base (daily views are also available). Almanac tracks more than 50 time zones so you can define events in their local times and be punctual for that meeting in Istanbul. The program also lets you add holidays and special dates using templates. Almanac is available for Windows 3.*x*, 95, and NT. Impact Software, 800/777-7687.

READER SERVICE NO. 833

Introducing the one device that provides complete multipath™ power protection for your PC and peripherals...

New Back-UPS® Office™

Visit APC's PowerPage™ at http://www.apcc.com

Back-UPS Office integrates the security of a surge suppressor with the power of a UPS. Until now, total power protection required several devices. But APC knows peak performance and maximum productivity depend on unified workstation protection. Corrupt power can enter the workstation environment on several paths-your A/C power cord, your telephone line, your data line-and in many forms. Without multipath power protection, every byte of data on the workstation's drives is in jeopardy. Without Back-UPS Office full time surge and site wiring fault protection, your hardware is at risk.

Back-UPS Office feature:

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- Battery Replacement Warning
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- 10 minute runtime with typical system
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- Convenient BlockSafe™ Outlet Spacing
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- $179.99 List Price

ough outlets to otect your entire system. x outlets guard your hardware with full ne surge protection. Three of the six outlets ovide instantaneous battery back up to keep ur system from crashing in the event of a ownout or blackout.

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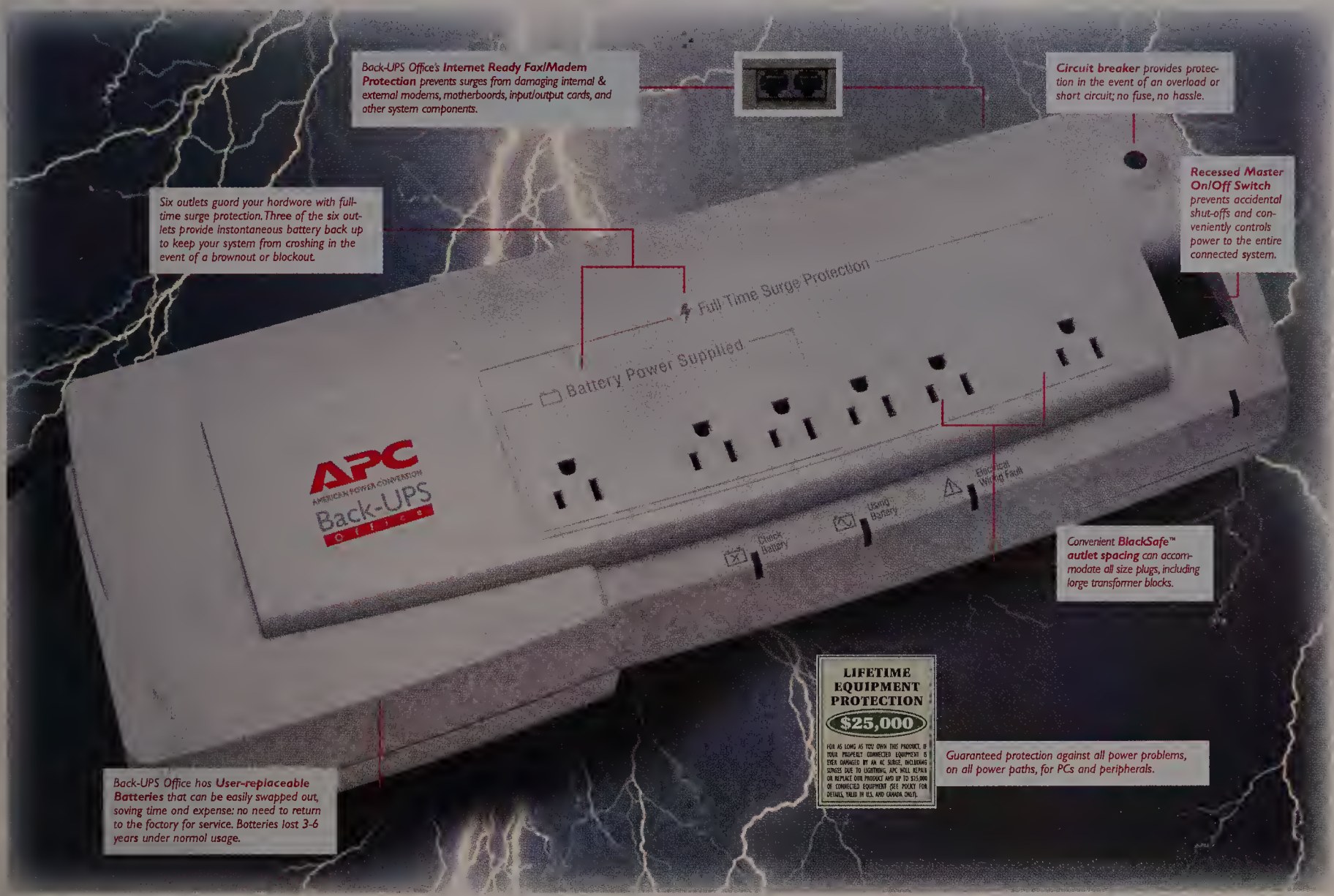
"They thought my new Multipath™ Back-UPS® Office™ was just a big surge suppressor – then the lights went out."



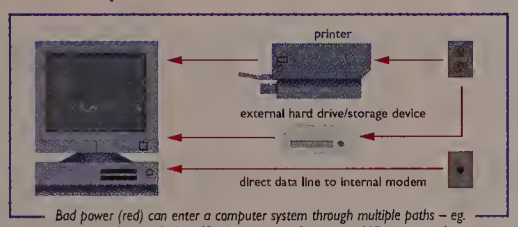
At last, a safe place to plug everything: Multipath Back-UPS Office for workstations, PC's and peripherals

Protect ME! APC

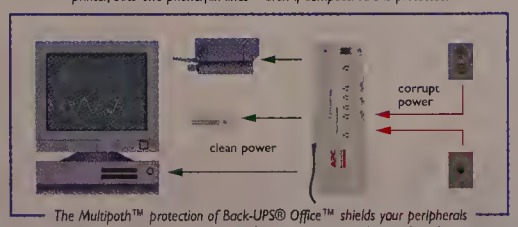
Facing the darkness is hard, but inevitable: You have a better chance of winning the lottery than of escaping power problems: They're the single largest cause of computer data loss and hardware damage.

Back-UPS Office provides reliable power for your entire system. Instantaneous battery backup ensures uninterrupted operation of your CPU, monitor and an external storage device. Full-time surge suppression and site-wiring fault protection spreads a true Multipath™ safety net under any remaining integrated peripherals, like modems, printers, faxes and phone systems. Back-UPS Office also provides convenient BlockSafe™ outlet spacing to handle all size plugs – even large block transformers.

Multipath™ Means Total Power Protection



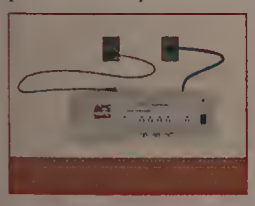
Bad power (red) can enter a computer system through multiple paths – eg. printer, data and phone/fax lines – even if computer A/C is protected.



The Multipath™ protection of Back-UPS® Office™ shields your peripherals and guards your computer from bad power on every path, providing clean, safe power (green), to your entire system.

Unique Multipath protection keeps your PC and data safe

Plugging a phone line into your computer doubles your vulnerability to power problems; add any peripheral, and it triples. Even if your AC power-line is shielded, when a surge hits an unprotected peripheral, it can blaze down serial and data lines, and toast your expensive PC.



Back-UPS Office's compact design installs easily on desktop, floor or mounts to wall.

Multiple peripherals and data lines to and from your system are vital, but dangerous. Without them, you can't do your job. However, if a power sag makes your modem drop the line while you're downloading from the Internet, or locks your keyboard before you've saved work, you lose time, money and spend another late night at the office to meet your deadline.

Back-UPS Office protects your entire system

Until now, protection for your entire system required several devices. But multi-device protection can leave you vulnerable to line noise and unwanted data glitches created by the voltage differential between outlets. Those glitches are prevented with the Back-UPS Office common voltage reference.

Back-UPS Office means true Multipath™ protection, clean, safe power to every peripheral, and instant battery backup to keep your cutting edge system and O/S from crashing. It means protection for less by integrating the security of a surge suppressor with the power of a UPS, guaranteed up to $25,000.

RECOMMENDED TEST CENTER 1996 Reseller News SPRING COMDEX

"Back-UPS Office [is] a shoo-in for the small-office/home-office computing market and for general desktop workstations"
-Computer Reseller News

APC has wan more awards far reliability than all ather brands cambined

The Multipath™ Power Protection Advantage	Traditional Surge Protector	Traditional UPS	Back-UPS Office
Protected Paths			
AC	•	•	•
Data			•
Phone			•
Total Outlets	7	2	6
Number of Block Outlets			2
Protection from			
Surges	•	•	•
Spikes	•	•	•
Blackouts		•	•
Brownouts		•	•
Overvoltages			•
Typical Runtime in Minutes			
with Pentium 100 w/15" monitor		10	10
Battery backup for			
PC		•	•
Monitor		•	•
Storage Devices/Zip Drives			•
Full-time surge protection for			
Fax/Modem	•		•
Laser Printer	•		•
Speakers	•		•
Dataline protection for			
Internet or Network			•

Traditionally, protecting all your equipment meant buying a surge suppressor and a UPS. Even then, only your AC line was protected. New Back-UPS Office protects all paths to your equipment: Bulletproof Multipath protection

Protect yourself before you kick yourself. Get your new Back-UPS Office today (list price: $179.99), or call APC for a FREE 60-page catalog!

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Circle 45 on reader service card

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- 3 Year Limited Warranty

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You may think all service programs are the same. But take a look at Dell's and one big word jumps out: Guaranteed.

Only Dell® guarantees that if there's a problem with your PC, a Dell-certified technician will be at your desk the next business day, servicing your PC. And in the rarest of events that we're not there the next day, you get an extra month of service at no charge. Just two of the many reasons why *PC Magazine* readers recently gave Dell an "A" for service and reliability.

The Dell service program reassuringly covers your Dell Dimension system for three full years. This includes one complete year of Guaranteed Next-Business-Day, On-Site service∆ and two additional years of Next-Business-Day Parts Delivery.

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*Guarantees available in the U.S. only for registered owners of Dell Dimension systems purchased after 8/1/93. †For a complete copy of our Guarantees or Limited Warranties, please write Dell USA L.P., 2214 W. Braker Lane, Suite D, Austin, TX 78758. ∆On-site service provided by BancTec Service Corp. On-site service may not be available in certain remote locations. ◊Business leasing arranged by Leasing Group, Inc. ★Prices and specifications valid in the U.S. only and subject to change without notice. The Intel Inside logo and Pentium are registered trademarks of Intel Corporation. MS, Microsoft, Windows, Windows NT and the Windows logo are registered trademarks of Microsoft Corporation. 3Com and EtherLink are registered Trademarks of 3Com Corporation. ©1996 Dell Computer Corporation. All rights reserved.

Network Computer Cuts Corporate Costs

DESKTOP

A NETWORK COMPUTER promises an irresistible combination of low price, simple setup, and powerful connectivity. HDS Network Systems' **@workStation** is an NC appealing to the corporate set with a built-in ethernet connection and a POSIX-based operating system that lets users run apps from a Windows NT server. The system also uses HDS's Java-enabled browser, Explorer, for Internet access.

Like other NC products, the @workStation cuts costs by moving storage and processing burdens to a remote server. With a 33-MHz Intel i960 RISC processor and 42MB PC Card hard drive, the @workStation can run as a standalone Internet machine. The system we tested costs $1500 and comes with 32MB of RAM, a 17-inch Nokia Trinitron monitor, keyboard, and mouse. A video camera and software provides video conferencing over the network. The lowest-end system, which features just 4MB of RAM and a 17-inch gray-scale monitor, sells for $750.

Setting up the @workStation can be tricky. As an NT client, the system must be configured with the usual array of network settings—a task best left to IS pros. Otherwise, the @workStation does its job smoothly: Applications such as Microsoft Excel and Access ran without a hitch over a dedicated ethernet network, and we were able to switch between our NT session and the HDS netOS environment easily. While HDS's graphical UNIX interface takes some getting used to, we found it easy to navigate, and the HDS Explorer browser—which is not related to Microsoft's Internet Explorer—let us view all the graphics and HTML layouts of Web pages. However, the browser software and Java applets loaded slowly, probably due to the less-than-mighty i960 CPU.

THE @WORKSTATION CAN run NT applications and access the Internet for as little as $750.

If you run an IS department and need to install thousands of workstations on a corporate network, then check out the @workStation: It can save you a bundle. But for stand-alone desktops, the market is still too young to make this NC a smart buy.

—*Michael Desmond*

@workStation

PRO: Corporate-minded network computer doubles as Internet device.

CON: Pricey for a PC replacement.

HDS Network Systems

610/277-8300

Street price: $1500

READER SERVICE NO. 821

QUICK TAKES

Enforced Ergonomics

Magnitude's **ErgoSentry** software attempts to make you take regular work breaks—but we didn't like the way these seventh-inning ergonomic stretches played out. Granted, we did look at a beta version of this program, but we were put off by its intrusive approach. We found the program would freeze the cursor when keystrokes or mouse movements exceeded our preset maximum. (The company says the final version corrects this.) It alerts you to take breaks with repetitive pop-ups of irrelevant quotes and clip art. For us, ErgoSentry quickly became ErgoNuisance. The program works with Windows 3.1, 95, or NT, and is $45 per user. Magnitude, LLC, 908/879-4303.

READER SERVICE NO. 834

Put Your PIM on Your Wrist

PIM

"DO YOU HAVE an appointment?" my doctor's receptionist asks in a crisp, businesslike tone. I glance at my **Timex Data Link 150** watch, tap a button a couple times and reply matter-of-factly: "Yes, at 3 o'clock." With the included Data Link 2.0 software, I can transfer information to and from Schedule+ for Windows 95: Not only can I upload appointments, anniversaries, and phone numbers, but I also can transfer lists, five daily alarms, and unique sounds for different alarms and ticklers.

This updated version of the Data Link Timex watch (which was first released some 18 months ago) doubles both the memory capacity—it now stores up to 150 appointments or task lists, for example—and the download speed of the original.

Data transfer is done à la Star Trek: You hold the watch face up to your computer monitor. The watch reads the data from your PC through a porthole-shaped eye on its face. The watch comes with a metal or leather wrist band, an Indiglo night-light, and a promised three-year battery life. It weighs 3 ounces, which is twice the previous weight. Even so, it still doesn't feel as heavy as my schedule.

—*Michael S. Lasky* ▶

Timex Data Link 150

PRO: Lots of room for contacts, appointments, and task lists.

CON: Single style may not suit all wearers.

Timex Corp.

List price: $139

800/367-8463

READER SERVICE NO. 822

QUARTERDECK®

CRASHSHIELD™ ALONE COULD COVER THE COST OF WINPROBE™ 95

(JUST THINK OF THE REST AS A BONUS)

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How many times has Windows 95 crashed on you? Can you *really* afford the downtime? Well, your worries are over at last. Because WINProbe 95's unique CrashShield works in the background, and intercepts fatal errors *before* they occur – and *before* you lose your work. But that's only the beginning of what WINProbe 95 has to offer you . . .

Diagnose Windows 95 Problems Using the Only Complete 32-bit Hardware Toolkit

You'll slash up to 50% off your PC repair costs by using over 200 comprehensive diagnostics – including non-destructive stress testing, automatic test logs and preventive maintenance. So, go ahead and run at peak performance! Test your system completely from within Windows, and get the answers you need to solve Windows 95 hardware problems in a flash.

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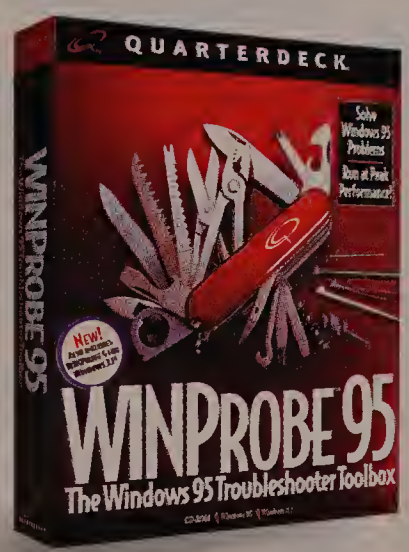
Reduce your start-up time and increase efficiency overall by scanning for invalid Windows 95 entries, and removing them easily and safely. Use WINProbe 95's *exclusive* Registry Guru™ to make editing your INI files and the Registry a snap!



Optimize Your PC's Performance

Control and improve system performance quickly and easily. Use WINProbe 95 to determine and re-assign individual application priorities, and speed-up important jobs. Plus, only WINProbe 95 features exclusive automatic recovery of lost or fragmented resources and memory!

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When Windows 95 help just isn't enough, simply click on the Knowledge Base. It offers a wealth of multimedia tune-up tips and how-to information on upgrading and repairing your computer.

Solve Problems Easily

Take control of your system! Quarterdeck's new WINProbe 95 is a state of the art, easy-to-use toolkit. You'll increase your productivity, and cut your downtime dramatically. To obtain WINProbe 95, your very own Windows 95 system toolkit, just visit the store nearest you – or simply call 1-800-683-6696!

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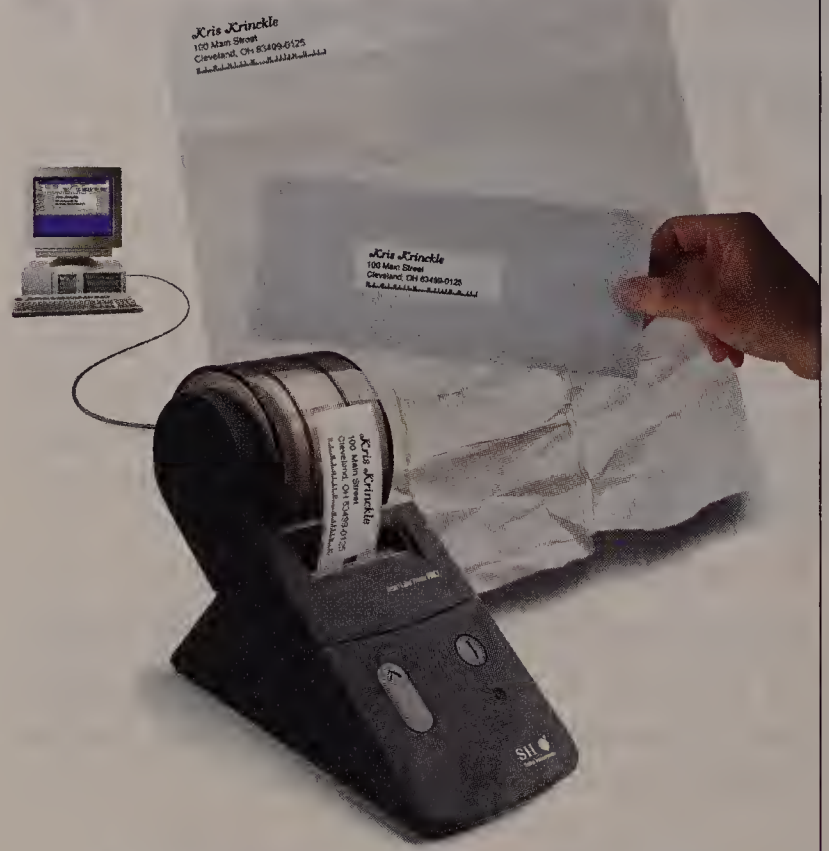
"Can't I Print Just One Label?"



The Smart Label Printer® The Smartest Way To Label Just About Anything.

Let's face it. Printing one label off an entire sheet just isn't smart. So use The Smart Label Printer instead. It's the easy, convenient way to quickly print labels for envelopes, packages, file folders, diskettes, ID badges, Rolodex® cards and VHS tapes–or anything else that needs a label.

Best of all, Smart Label software can automatically capture an address or text right from your computer screen. There's no need to retype it. Which means you can print it instantly or save it to the built-in database. You can even customize it with fonts, graphics and bar codes. What's more, you can print a label without exiting an application, whether it's in an MS-DOS, Windows or Macintosh system.

The Smart Label Printer® EZ30. And The Smart Label Printer® Pro. Printing labels any other way is a waste. Call for yours today.
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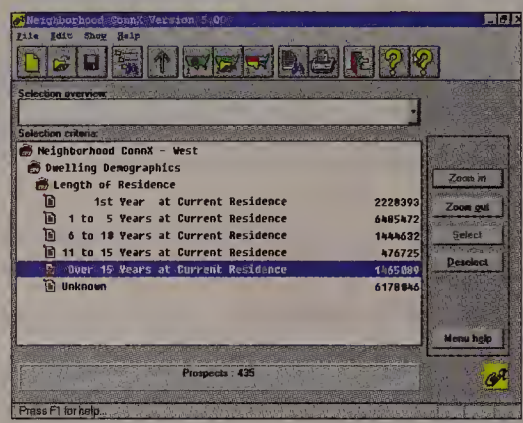
Circle 188 on reader service card

Easy Direct Marketing With ConnX

BUSINESS

MOST SMALL BUSINESSES and home offices rely on direct marketing. But finding the names and addresses you need can be difficult, if not impossible. **Business ConnX** and **Neighborhood ConnX**, two new products from Serious Business Software, attempt to meet the direct-mail needs of small businesses. While Business ConnX focuses on information relating to about 11 million U.S. businesses—including such data as company size—Neighborhood ConnX concentrates on consumer statistics.



THE CONNX SOFTWARE is easy to use, and can help take the guesswork out of finding your business's target demographics.

To look for prospective customers in Business ConnX, you begin by choosing a type of company or a location. Then you work on narrowing the data by TRW credit rating, number of employees, and sales volume, as well as several other criteria.

We found this process to be surprisingly straightforward and simple, even without ConnX's helpful interactive tutorial. Once we refined our efforts to the most likely candidates, we could export the information to several databases or print directly to mailing labels. You can also just browse the names.

Naturally, this kind of information comes at a price. Viewing the data is free, but there is a charge (in the form of "credits") for each name you actually export or print. You get $50 worth of credits free with Business ConnX, which buys you about 500 names. The more detailed the information, the more credits you use.

Neighborhood ConnX works exactly the same way, except that it supplies the names of individuals, not businesses. You can narrow its universe of 90 million households to your target population by searching for stats on home ownership and estimated household income, as well as eight other parameters.

Quarterly updates are available for both Business ConnX and Neighborhood ConnX through a yearly subscription of $154. Small businesses will appreciate having access to such tools and data.

—*Shane Mooney* ▶

Business ConnX, Neighborhood ConnX

PRO: Accessible information for small businesses.

CON: Per-address price seems high.

Serious Business Software, Inc.
813/288-8548
List price: $189

READER SERVICE NO. 823

QUARTERDECK

CleanSweep® 95 is the first 32-bit uninstaller.

We also believe it's the only uninstaller worth looking at, period. But you don't have to take our word for it.

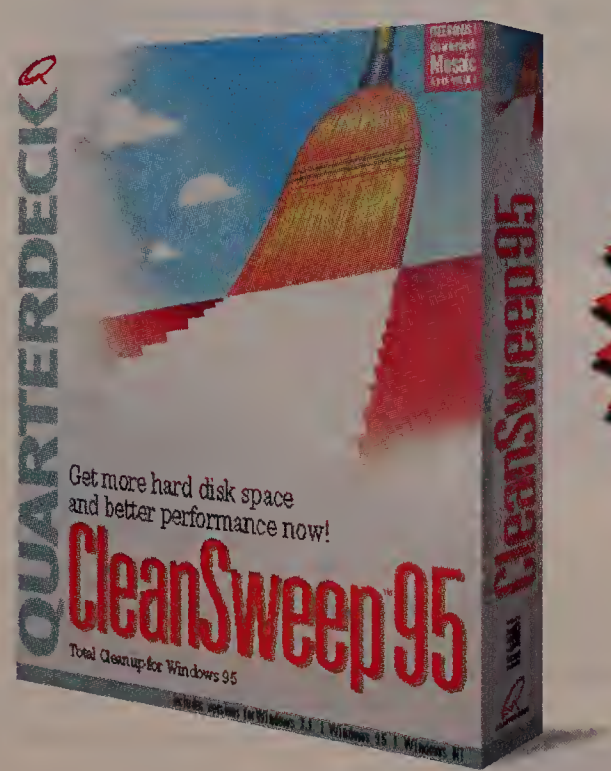
"Because [the competition] has a weaker Windows cleanup module, I continue to recommend CleanSweep 95..."
InfoWorld, Jan 22, '96

"...CleanSweep 95 is an essential purchase for anyone...with Windows 95."
PC Magazine, Jan 9, '96

"Quarterdeck's CleanSweep gets the User's Choice Award for uninstaller software."
Jerry Pournelle, Byte, Apr '96

"CleanSweep 95's user interface is still the simplest and most intuitive of all the commercial uninstallers PC Week Labs has seen."
Jim Rapoza, PC Week, Nov 6, '95

"The leader in unit sales for Windows 95 and Windows NT."*
PC Data



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Acrobat 3.0 Adds Interactive Elements, Browser Support

PUBLISHING

WANT TO EXPORT your business documents to the World Wide Web without using an HTML editor? With Adobe's new **Acrobat 3.0** software, you can easily post documents created with standard word processing, spreadsheet, and presentation software without losing the documents' original look and feel. Moreover, an integrated form feature lets you add radio buttons and fill-in fields, such as list boxes, so users can enter data directly or access it from any linked database. And Acrobat now comes with macros for Microsoft Word and Excel (for Windows 95) that create a function in your File drop-down menu for one-click Portable Document Format file output.

With the latest version of Acrobat, PDF documents can be embedded directly in an HTML page using the HTML <EMBED> tag; you don't need to download a separate Acrobat viewer to read them. You just fire up your browser (Internet Explorer or Netscape Navigator version 2.0 or higher), and voilà—there they are!

Tired of waiting for graphics-heavy Web pages to download? Acrobat 3.0 also adds a feature that lets users retrieve and view documents one page at a time, with text rendered first, while larger objects such as graphic images are downloaded in the background and rendered later.

An Acrobat 3.0 demonstration showed that forms and dynamic controls are easy to integrate into the PDF file format using Adobe's proprietary tools to create them. With forms, you can add text fields, list boxes, radio buttons, and check boxes to otherwise static pages, maintaining extensive control over the appearance and behavior of the various form elements. Dynamic controls, such as buttons and live areas, can execute any menu item and perform a variety of actions, from navigation to playing movies and sounds.

Acrobat 3.0 supports QuickTime (Macintosh and Windows versions) and AVI (Windows) movie formats. It also comes with the Acrobat Capture plug-in that lets you scan and convert paper documents into PDF files. The plug-in preserves the exact format and page layout of the original document, including the text and graphics. If a scanned word is not recognized, the program replaces it with a bit-mapped image of the word and places ASCII text behind it so it remains searchable. For automatic batch processing and reviewing capabilities, however, you'll have to use the full Acrobat Capture 1.01, which retails separately for $895.

—*Samantha Parent* ▶

Adobe Acrobat 3.0

PRO: Popular browsers support PDF files, online viewing is faster.

CON: None.

Adobe Systems Inc.

800/272-3623

List price: single-user license $295, ten-user license $1595

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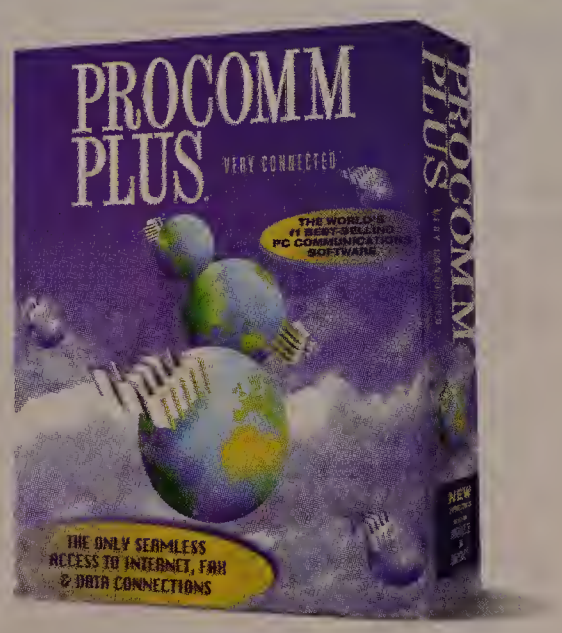

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New Troubleshooter Fixes Windows 95 Hardware and Software Problems

UTILITY

IF YOUR TIME is money, Vertisoft's **Fix-It**, a new Windows 95 troubleshooting utility, could pay for itself in a hurry. Like CyberMedia's First Aid 95 application, Fix-It helps you resolve software conflicts, tunes up PC performance, and provides crash protection. However, Fix-It also troubleshoots hardware configurations and supports over 1000 applications.

Although the beta version of Fix-It we reviewed was not complete, the program successfully sniffed out several problems. Fix-It found an incorrectly configured hardware device, then linked the device to Win 95's Device Manager to correct the error. Fix-It also discovered several applications with conflicts or missing files (such as .exe and .dll files we had temporarily removed or zipped), as well as other apps guilty of incomplete installations. You can click an on-screen tab to view details of each problem and its solution.

Fix-It isn't perfect. It didn't give me a chance to back out when it replaced several Shortcuts with the wrong names, and it had trouble recognizing an installed CD-ROM drive. I'd also like to see Vertisoft use its World Wide Web site to provide instant updates to the program. Still, based on our preliminary tests, Fix-It looks like a useful, affordable program for solving Windows 95 problems.

—*Richard Jantz*

Fix-It

PRO: Tracks down and fixes several hardware and software problems.

CON: Incorrectly names Shortcuts.

Vertisoft Systems, Inc.

800/466-5875, 415/956-5999

Street price: $50

READER SERVICE NO. 825

QUICK TAKES

Performance Review

One of the best-selling performance review software products has been improved with new management tools and suggestions. **Performance Now**, out in a new **Enterprise Edition**, lets managers in medium- and large-size organizations work together to set and measure goals and share employee reviews. The $249 program features new management-oriented performance categories, coaching ideas, and improved security. Performance Now also lets you extract performance review data for human resources applications or spreadsheets, making it useful for comparing departmental performance across your organization. KnowledgePoint, 800/727-1133.

READER SERVICE NO. 835

Better ZIP Apps

UTILITY

MICROHELP AND SOFTWARE Builders have extended the already ubiquitous ZIP utility. **MicroHelp Zip** integrates with Windows 3.1's File Manager and 95's Explorer to offer a full drag-and-drop interface. A viewer lets you peek at the contents of a file without unzipping it. The $29.95 MicroHelp Zip also supports the TAR and UUEncode/UUDecode compressed file formats that you'll often find on the Internet. Software Builders' $39.95 **NetZip** utility gives you a drag-and-drop interface for ZIP and TAR files on your PC and, more notably, comes with a Netscape plug-in and Java applets that let you preview the contents of Zip files before you download them.

MicroHelp, 800/777-3322, http://www.microhelp.com.

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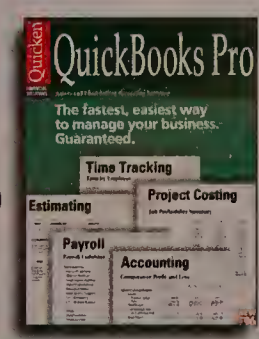

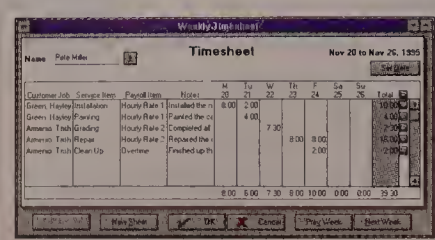

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Inso Search Wizard Provides One-Stop Web Searching

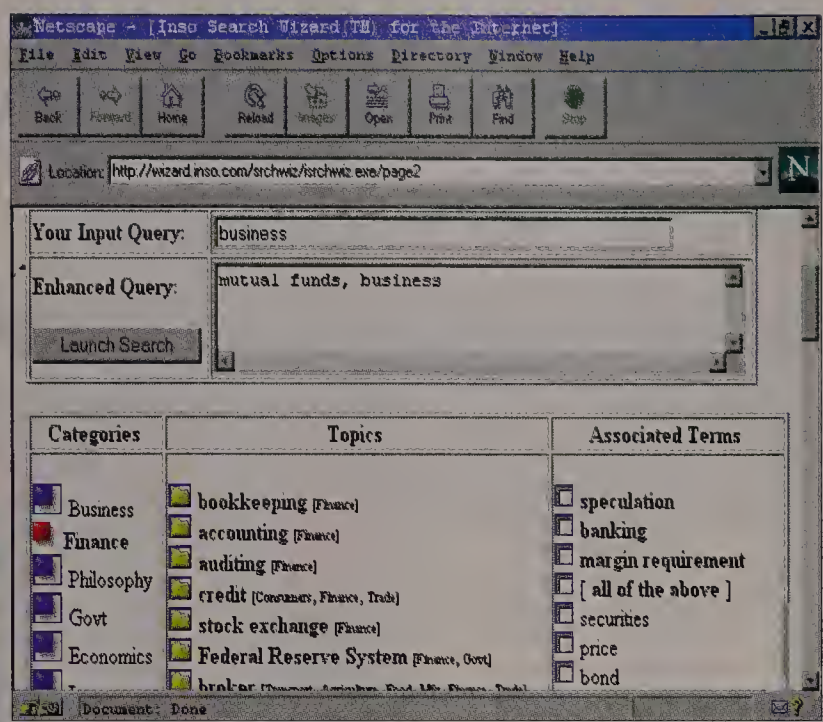
ONLINE

WITH THE PROLIFERATION of search engines on the World Wide Web, checking each one for the information you need can be time-consuming. **Inso Search Wizard**, a one-stop clearinghouse for searches, addresses this problem by working in conjunction with eight of the Web's more popular search engines.

To get basic stock-market information, for example, we did a preliminary search on AltaVista. What came up were pointers to financial stocks and bonds, as well as to sites of a more sexual nature. But Inso Search Wizard walked us through a few steps that helped refine and narrow our search. Then the program accessed several engines (AltaVista, Excite, Infoseek, Lycos, Magellan, Open Text, WebCrawler, and Yahoo), correctly entered our parameters into each, and displayed each engine's icon along with a search summary. Clicking on one of the icons gave us access to that engine's results.

Even if you rely on one favorite search engine, Inso Search Wizard is a great way to efficiently find the information you need.

—*Shane Mooney*



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You can structure your questions in a number of ways, then analyze the responses by category, quantity, rank, frequency, or other methods. Results can be displayed using more than 25 different graphs. A free Survey Said demo let me generate an HTML version of a sample survey form and view it in my browser. You can check out the demo at http://bicnet.com. **Marketing Masters, 414/490-8770.**

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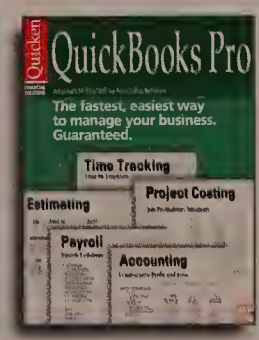

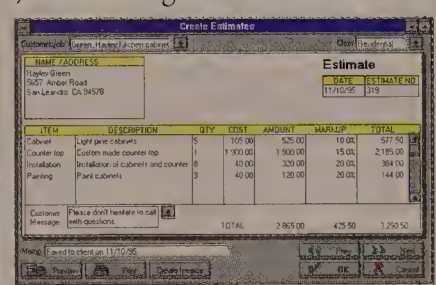

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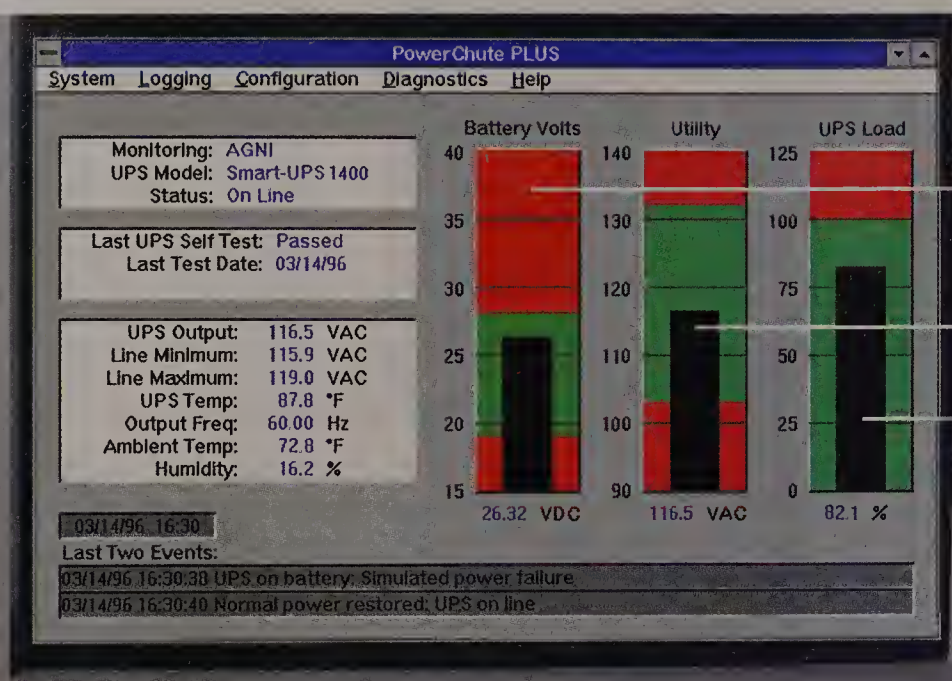

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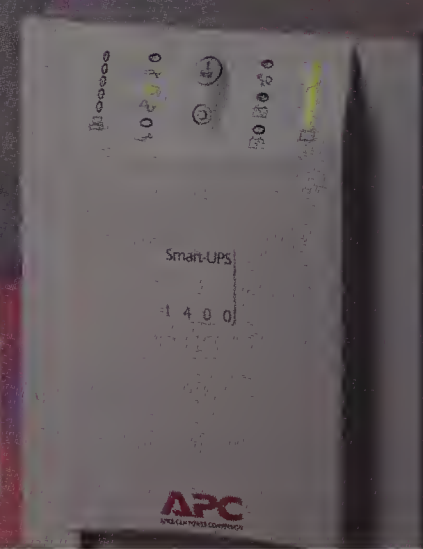

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- Environmental/power monitoring-allows you to quickly diagnose power problems and thus decrease network downtime without the expense of an electrician.

PowerChute *plus* also provides:

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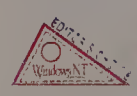

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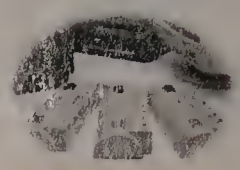

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Goofy Graphics Made Easy

GRAPHICS

IMAGINE GRAPHICS programs that let you distort a photo as if it were Silly Putty. In a nutshell, that's what MetaTools' **Kai's Power Goo** and Human Software Co.'s **Squizz 1.5** can do. With either of these affordable and easy-to-use programs you can add special effects to bit-mapped images.

Kai's Power Goo features a sleek, colorful interface. Just load a photo, click an effects tool, and select the part of the image—such as a person's eyes—that you wish to smear, bulge, or twirl into a subtle or more mischievous contortion.

You can save the image, or combine several images into a morphlike movie, which you can save as an AVI video clip. Goo also has tools that let you blend two pictures together. The $49.95 Goo comes with a library of stock photos.

FUNHOUSE MIRROR EFFECTS are easy to add with Kai's Power Goo.

Unlike the stand-alone Goo package, the $99 Squizz is a graphics plug-in filter that works only with plug-in–compatible applications, such as Adobe Photoshop and Corel Photo-Paint. Squizz doesn't do as many tricks as Goo—no movies or picture blends. But there are enough tools to let you squeeze and twist images to your heart's delight. It has more professional-level features than Goo, such as a grid mesh and RGB and CMYK color editing modes.

With either product you can create fantastic images, but Goo is more entertaining.

—Richard Jantz

Kai's Power Goo

PRO: Entertaining image effects.

CON: None.

MetaTools, Inc.

800/472-4025

Street price: $49.95

READER SERVICE NO. 830

Squizz 1.5

PRO: Plug-in for distortion effects.

CON: Works only with plug-in apps.

The Human Software Co.

408/399-0057

List price: $99

READER SERVICE NO. 831

Small-Biz Billing

BUSINESS

PROFESSIONALS WHO rely on billing time to make a living should check out **Time & Profit 1.2 for Windows**. It takes on most of the organizational headaches associated with tracking billing records. Time & Profit integrates and automates client records and calendar, billing, and accounting functions. The program also allows one-button billing and printing of invoices and statements. With these steps built into the program, Time & Profit should let you spend less time keeping records and more time doing billable work. Time & Profit does accounting in the background automatically, letting you move on to other tasks. The product lists for $269. **BytePro, 800/713-5322, 714/622-0884.**

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For more information about a product, contact the manufacturer or circle the number on the reader service card. ■

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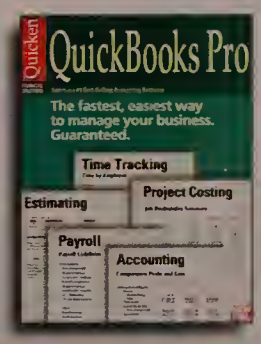

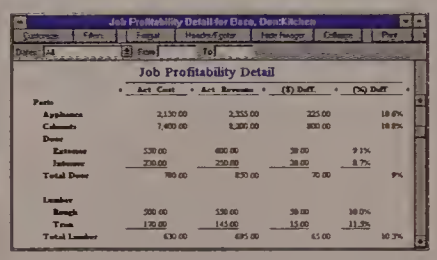

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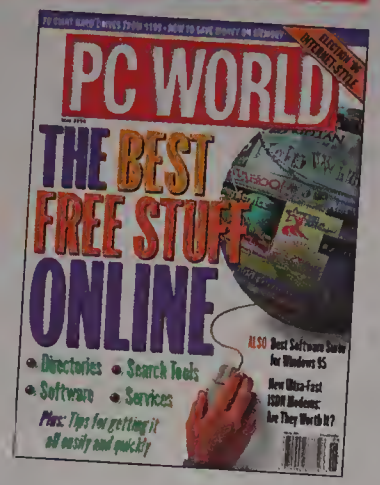

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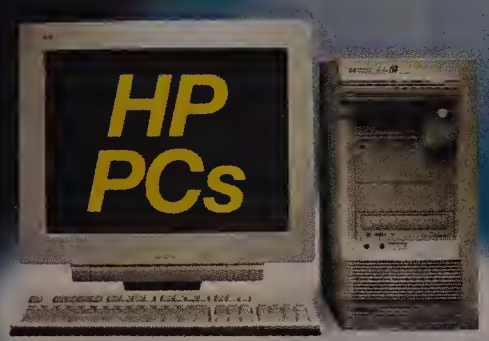

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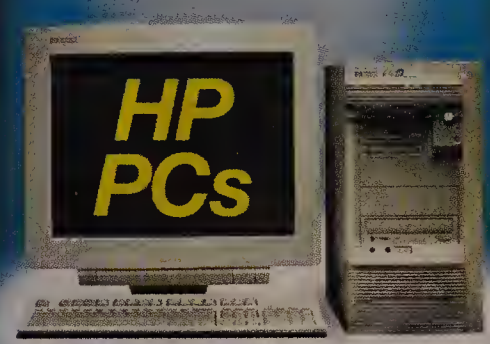

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CD-ROM Drives

BEHIND THE RATINGS

THINK 8X DRIVES ARE TWICE AS FAST AS 4X? THINK AGAIN. OUR TESTS OF 21 CD-ROM DRIVES AND MINICHANGERS SEPARATE THE REAL THING FROM THE PRETENDERS.

BY REX FARRANCE AND THERESA W. CAREY

THESE DAYS, IT'S HARD to imagine a serious computer user who doesn't need a CD-ROM drive. Even if you don't play games or use references like Microsoft Bookshelf, you still have to install and upgrade software. And in case you haven't noticed, today's apps are *big*. It takes a lot longer to install Office Pro 95 from 24 floppy disks than from a single CD-ROM. But not all drives are created equal—there are critical differences you need to know about. If you go about buying a CD-ROM drive the same way you shop for a new toaster, you'll likely get burned. For this special report, we reviewed 21 single-disc and minichanger CD-ROM drives, including some of the fastest available. (All are internal models except for one minichanger.) For the single-disc drives, we concentrated on 8X and 6X drives and exclud- ▶

PHOTOGRAPHS BY DANIEL FURON

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ed older 4X units. To separate the winners from the also-rans, we stacked up each drive against our new Windows 95 test suite. We tested them performing everything from loading an application to playing full-motion video. The results prove that speed designations don't tell the whole story. Of seven 8X products, only Plextor's 8Plex was faster than *every* 6X drive. The slowest 8X—Chinon's 8X-Speed CD-ROM Drive—was actually outperformed by the 4X Mitsumi CRMC FX400E we used for comparison. The performance of the nine 6X drives we reviewed also varied widely. Plextor's 6Plex was fastest—almost matching its 8X sibling and beating every other 8X. But fully one-third of the 6X models couldn't best our 4X Mitsumi.

How much do these differences mean to your everyday work? Plenty: CD-ROM business tasks, such as installing software, giving slide-show presentations, and running apps from disc, all benefit from the fastest drives you can buy right now (see the Test Report). However, if commercial titles run well on your current drive, don't expect much improvement. Publishers master these apps to the lowest common denominator so they'll run on slower drives.

We also reviewed five CD-ROM minichangers, all 4X models (the fastest available at press time). These units cost more than most single-disc drives, but they should interest those who frequently switch back and forth between CD-ROMs, as they hold multiple discs and do the switching for you (see "Let Your Changer Do the Swapping").

No discussion of CD-ROMs today would be complete without a serious look at DVD-ROM—which essentially will be a bigger and better CD-ROM. So we've included "DVD: One Giant Step for CD" to fill you in.

For easy comparison, we've also included a chart on the following pages that allows you to compare prices along with other factors critical to your buying decision. It ranks the top ten single-disc drives and all five minichangers separately in order of overall value, and includes comments on each product. For easy reference, we've included our own grades on price, performance, ease of installation, and ease of use. Other info—such as average access time, built-in buffer size, mean time between failures, and length of warranty—comes straight from the vendor.

BEST BUYS

THERE'S SOMETHING HERE for everyone: The number one Diamond Multimedia 8X CD-ROM Upgrade Kit is faster than any of the other EIDE drives. For $249, it includes Compton's Interactive Encyclopedia 1996 and the ISA adapter that older PCs will need. At $604 and $464, the uncompromising Plextor 8Plex and 6Plex SCSI drives are priced beyond the budgets of most individuals. But their top performance, two-year warranty, and bundled PCI SCSI card make them the best choice for business and network use. The $199 Teac CD-58E 8X CD-ROM Drive Kit is a good performer that accommodates older PCs with an ISA EIDE card. The same price will snag you our fifth Best Buy, the GoldStar GCD-R580B, a quick, no-frills 8X EIDE drive that's good for personal use.

THE PLEXTOR 8PLEX SCSI DRIVE (right) is fastest and most expensive with its Adaptec PCI card. The Diamond Multimedia EIDE drive (left) combines good speed and a lower price.

DANIEL FURON

WHAT'S THE DIFFERENCE?

THE TYPE OF DRIVE you buy depends on your needs. CD-ROM drives come in two flavors: Enhanced IDE drives are inexpensive and the best choice for most users. SCSI drives cost more; typically they're used by businesses and in shared LAN applications. EIDE CD-ROM drives, often called ATAPI (for AT Attachment Protocol Interface) drives, come only as internals, so you'll need a free accessible 5¼-inch drive bay.

If you're adding an EIDE drive and your PC is just a couple years old, you can probably hook the drive to a secondary IDE adapter on your motherboard. Otherwise, you'll need an EIDE card, which many of the drive kits include.

SCSI drives, such as the two Plextor models in this review, are more expensive. Few motherboards include integrated SCSI, so you'll have to make sure you have a SCSI adapter. But as with other SCSI peripherals, it's possible to hook up as many as seven SCSI devices to each adapter card. That saves PC slots and makes SCSI CD-ROM drives the best choice for server-based network hookups. (EIDE drive hookups are limited to two per connector.) For top performance, you can combine SCSI drives with a fast bus-mastering PCI controller. Bus-mastering adapters have their own processors to take care of delivering data from the CD-ROM to memory. That leaves the CPU free to do other work.

All the drives seem well built, but some designs do stand up better to hard use. SCSI drives typically require a special CD-ROM holder called a caddy. Caddy feeds are sturdier but less convenient than the motorized tray feeds found on most EIDE drives. Caddies also protect discs from dust and fingerprints. Finally, if you lack a free bay, SCSI external models are available for about $100 more than comparable internals. ▶

Thanks to the generally clear instructions that came with each single-disc drive, all the installations were quite easy. At press time there was still no official Plug and Play spec for IDE devices. But almost all the EIDE models worked with Windows 95's automated built-in CD-ROM support. With earlier versions of Windows, you'll always have to install a separate software driver. The Plextor SCSI kits require installation of both an adapter card and drivers, but all the included hardware supports SCSI Plug and Play and worked without a hitch.

BUYING THE BEST

WE CHOSE OUR BEST BUYS based on price, performance, ease of use, and service policies. Our number one choice is the Diamond Multimedia 8X CD-ROM Upgrade Kit. For $249, this 8X EIDE drive is hard to beat, and it outperformed every other EIDE drive we tested. The bundled Compton's Interactive Encyclopedia 1996 is a nice extra, and an ISA adapter is thrown in. (Don't confuse this product with the much slower 8X Diamond Multimedia Upgrade Kit that was being sold last fall.)

Plextor's 8Plex and 6Plex drives earn the next two Best Buys. The best choices for business and network use, they earn their stripes with top-notch performance and attractive two-year warranties. Plextor's bundled Video CD With MPEG software driver allows you to play video CDs. And each kit includes an excellent 32-bit Adaptec AHA-2940 PCI host adapter. At $604 for the 8Plex and $464 for the 6Plex, neither will fit the budget of the casual buyer. Although they're available without adapters for $399 and $279 respectively, the PCI card contributed strongly to their first- and second-place speed ratings.

Our last two Best Buys are affordable EIDE drives. The Teac CD-58E 8X CD-ROM Drive Kit is a bit slower than the Diamond. But for $199, Teac throws in audio CD player software along with an ISA interface card. The GoldStar GCD-R580B 8X model uses the same drive mechanism as the number one Diamond, but it performed less quickly. The $199 price buys you just the drive and its drivers with no software freebies or interface card.

TESTS THAT WORK

THE PC WORLD TEST CENTER designed its benchmarks to reflect the demands of real work and determine the drives' ultimate capabilities. The 8X drives are new enough that we could find no commercial application that could really test their video capabilities. So we asked the Intel Architecture Development Lab to master a video test to our specifications using a 4X transfer rate and the company's Indeo compression code. The clip ran at 30 frames per second, and the system had to take on a tremendous decod-

CD-ROM DRIVES AND MINICHANGERS SCORECARD

	SINGLE-DISC INTERNAL DRIVES	Street price (5/21/96)	Drive speed	Comments	Price rating	Overall performance rating	Ease of installation	Ease of use
1	Diamond Multimedia Kit*	$249	8X	Fast EIDE drive comes with encyclopedia.	average	good	very good	outstanding
2	Plextor 8Plex*	$604[2]	8X	Ultrafast with included PCI card, great for heavy use.	very expensive	outstanding	very good	very good
3	Plextor 6Plex*	$464[2]	6X	With the PCI card, it's almost as fast as the 8Plex.	expensive	very good	very good	very good
4	Teac CD-58E Drive Kit*	$199	8X	Good performance for the price, plus ISA card.	inexpensive	good	very good	outstanding
5	GoldStar GCD-R580B*	$199	8X	Fast and well priced, but comes with no extras.	inexpensive	good	very good	outstanding
6	Teac CD-56E Drive Kit	$179	6X	Good performer for the money, includes ISA card.	inexpensive	satisfactory	very good	outstanding
7	Mitsumi FX800	$199	8X	Good price/performance balance.	inexpensive	satisfactory	very good	outstanding
8	NEC MultiSpin 6V	$99	6X	Not fast, but it's an NEC and the price is great.	very inexpensive	poor	very good	outstanding
9	Mitsumi FX600	$149	6X	Fair price/performance balance.	inexpensive	poor	very good	outstanding
10	Toshiba XM 5602	$170	6X	Well made, but the tech support hours are short.	inexpensive	poor	very good	outstanding
	MINICHANGERS							
1	Nakamichi MJ 4.4	$279	4X	Convenient slot feed, as fast as some 6X drives.	average	poor	very good	very good
2	Alps CD544C	$260	4X	Uses a disc magazine, had some installation woes.	average	poor	poor	good
3	Pioneer DRM62AX	$329	4X	You'll have to add the cost of a SCSI adapter.	expensive	poor	poor	good
4	Turtle Beach TBS 3000	$249	4X	Holds only three discs, but has full audio controls on front.	average	poor	very good	good
5	NEC MultiSpin 4X4	$279	4X	NEC says upgraded driver should make it perform faster.	average	unacceptable	very good	very good

* Best Buy [1]8 hours on Saturday. [2]With PCI adapter. [3]Toll-free. See Test Report, page 120.

ing workload. If a drive demanded too much help from the CPU, the system dropped an unacceptable number of frames, and the video display would become jerky. By counting the dropped frames, we were able to measure which drives are best for video play.

We also timed a Corel Pro Photo CD slide show to see how quickly each drive could page through photographic images. This fairly difficult test is a very real-world measure of the performance you can expect when displaying slides during a presentation. The next benchmark used Microsoft Bookshelf 95 to perform a simple text search. Then to get a sense of how much time could be saved installing a business application suite using a fast drive, we installed Lotus SmartSuite 96 from CD-ROM.

Some software apps load automatically when you insert their discs. We sampled this auto-run capability using TurboTax 95, measuring the time elapsed from loading the disc in the drive until the program's welcome screen appeared. To complete our TurboTax 95 test, we ran the program from the CD-ROM.

The two Plextor drives were fastest overall. And as with the other fast drives, they were fairly consistent on all benchmarks. On the tough video test, their bus-mastering adapters took over, efficiently controlling the data transfer and allowing the system CPU to handle the video decompression. The result for the 8Plex was the only perfect video score, and the 6Plex was nearly as good. In contrast, most of the drives reviewed here dropped over a third of the frames; the Diamond Multimedia is the only other drive that dropped less than a tenth of the clip's total frames.

The Plextor drives also went to the head of the class on the Corel Pro slide show. The relatively easy Bookshelf text search produced very even results, and all the drives performed acceptably.

On the SmartSuite installation, you might expect an 8X drive to outperform a 4X two to one. But more than the transfer rate comes into play, as a good share of the time is spent writing to the hard disk. So the variation between the fastest drive (the Plextor 8Plex) and the slowest (the NEC MultiSpin 4X4 minichanger) was only about 25 percent.

The TurboTax 95 test showed a diversity of results that didn't always correlate with the drives' performance on other benchmarks. On the auto-run part of the test, the Plextor 6X and 8X drives, the Teac 6X drive, and the Alps 4X minichanger all finished in 8 seconds or less, whereas the 4X Pioneer minichanger took 24 seconds to accomplish the same task. Running TurboTax from the CD-ROM itself, the fastest drives completed this part of the test in 20 seconds or less (down to a low of 13 seconds by Mitsumi's FX600). The slowest, the Creative Blaster CD 6X, took 45 seconds. ▶

FEATURES | SERVICE AND SUPPORT

Interface	Interface card included	Bundled application software	Average access time (ms)	Built-in buffer (K)	Win 95 plug and play	Mean time between failures (1000 hours)	Warranty (years)	Weekday support (hours)	Repair turnaround (days)	Phone	Reader service number
EIDE	●	Compton's Encyclopedia 1996	150	256	●	125	1	14[1]	3	800/468-5846	601
SCSI	●	Video CD With MPEG	115	256	○	100	2	11	7	800/475-3986	602
SCSI	●	Video CD With MPEG	145	256	○	100	2	11	7	800/475-3986	603
EIDE	●	audio CD player	140	256	●	100	1	9[3]	10	800/888-4923	604
EIDE	○	–	150	256	●	50	1	9	7	800/243-0000	605
EIDE	●	audio CD player	140	256	●	50	1	9[3]	10	800/888-4923	606
EIDE	○	Disc Detective	150	256	●	50	1	10[3]	7	800/648-7864	607
EIDE	●	–	145	128	●	100	1	12.5[3]	10	800/615-5566	608
EIDE	○	Disc Detective	180	128	●	50	1	10[3]	7	800/648-7864	609
EIDE	○	–	135	256	●	100	1	7	–	800/334-3445	610
EIDE	●	–	250	128	○	100	1	10	3	800/421-2313	611
EIDE	●	MultiPlayer	210	128	○	50	1	12[3]	–	800/825-2577	612
SCSI	○	–	150	128	○	50	1	11[3]	5	800/444-6784	613
EIDE	●	50 shareware, CD Sampler	200	256	○	–	2	7	5	510/624-6200	614
EIDE	●	–	250	128	○	50	1	12.5[3]	10	800/615-5566	615

● Yes ○ No

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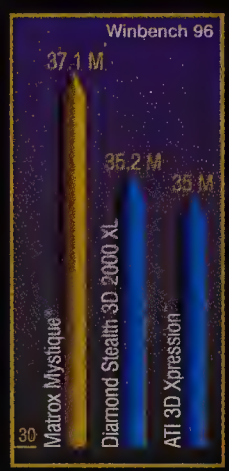

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Benchmarks tests conducted by Matrox Graphics Inc. on a Gateway P5-166 configured with Intel P5-166Mhz, 16MB of EDO RAM with 256K cache. Matrox Mystique, Diamond Stealth 3D 2000XL and ATI 3D XPRESSION were configured with 2 MB of memory for the PCI bus using driver releases 3.10, 4.02.012 and 2.22 respectively for Windows 95 and driver release 1.00.002, 4.03.00.1096, and 4.03.00.1096 respectively for Direct3D. WinBench 96 tests conducted at 1024 x 768 resolution with 8-bit color at 75Hz refresh using large fonts under Windows 95.

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A CD-ROM DRIVE IN EVERY PC

YOU'LL SEE SOME FAMILIAR names that didn't earn Best Buys. Teac's $179 6X EIDE drive came close at number six; it's just a little slower than Teac's 8X, with identical features. The seventh-place 8X Mitsumi FX800 wasn't quite as fast as Teac's 6X. But for $199, Mitsumi throws in its Disc Detective audio software for premastering CD–CD-ROM hybrid discs to tape. Mitsumi's similar $149 6X FX600, which doesn't perform as well, takes the ninth spot. NEC's good reputation and a tantalizing $99 price should help a lot of buyers overlook the MultiSpin 6V's undistinguished performance. Landing in eight place, it includes an EIDE card. Another bargain, the $79 Aztech Zeta 6X EIDE model, will interest many buyers, but it didn't perform as well as our 4X comparison drive. The tenth-place 6X Toshiba XM 5602 is a serviceable, well-made EIDE drive. It comes with Toshiba's impeccable reputation but no extras for $170.

After the Aztech, which almost made our chart, the value level plunges. ▶

Let Your Changer Do the Swapping

DO YOU FIND YOURSELF using the same few CD-ROMs over and over? If so, a CD-ROM minichanger could save you some disc shuffling. These handy devices are CD-ROM drives that hold three to six discs at a time, so your kids won't get peanut butter on your Quicken Deluxe every time they want to play The Magic School Bus.

We reviewed five minichangers: Turtle Beach Systems' $249 TBS 3000, Pioneer's DRM62AX SCSI changer ($329 with no SCSI adapter), the $260 Alps CD544C, the $279 Nakamichi MJ 4.4, and the $279 NEC MultiSpin 4X4. The Turtle Beach holds three discs, the Pioneer six, and the others four. All the changers are EIDE internals except the Pioneer, which is a SCSI external. The Nakamichi is the only one good enough to merit consideration; it outperformed all but two of the 6X single-disc drives we reviewed. At press time the fastest minichangers still used a 4X drive mechanism—although Nakamichi planned to have a more expensive SCSI 8X model out by midsummer. Four of the five changers had performance inferior to our 4X Mitsumi CRMC FX400E comparison drive's. Ironically, the NEC, which uses the Nakamichi mechanism (but NEC's driver), was the slowest. NEC said an updated driver—which arrived too late for performance testing—would fix the problem.

KEEPING TABS ON DISCS

WE FOUND ONE COMMON SOURCE of frustration: When we rotated in a new CD-ROM, we had to keep track of which drive Windows 95 assigned the program. And every time we reinserted a disc, we had to put it in the same internal position. Otherwise, we got 'Not Found' when trying to load. Pioneer's driver allowed access to all the CD-ROMs under one drive letter—as will NEC's updated driver.

The four-disc Nakamichi and NEC changers came with clear fold-out instructions and stood out for ease of installation. The three-disc Turtle Beach TBS 3000 minichanger's documentation isn't as good, although the product was almost as easy to install.

On the other hand, setting up the shoebox-size external Pioneer DRM62AX SCSI changer had us grabbing for the Maalox. In a classic example of catch-22, we found we had to load a driver from our Windows 95 CD-ROM—but without the drive installed we couldn't access the disc. So we had to install one of our other CD-ROM drives, copy the needed driver, *then* install the Pioneer unit. The DRM62AX ran smoothly once it was installed.

The Alps CD544C also presented some challenges. Alps recommends using the bundled EIDE adapter, but even when we tried to disable the motherboard's secondary IDE adapter, our PC couldn't find the drive under Windows 95. We backtracked and used the secondary IDE adapter, and installation proceeded—though we had to download a new driver to correct a drive-addressing glitch.

SLOTS WORK BEST

THE DRIVES TAKE VARIOUS approaches to accepting discs. The Alps, Pioneer, and Turtle Beach use a magazine you preload and insert. The Nakamichi and NEC load and unload discs through a slot. They all worked, but we liked the convenience of the Nakamichi and NEC the best and the Alps's somewhat awkward magazine the least.

The Pioneer's six-disc capacity is impressive. You load each CD into a magazine with finger tabs staggered for pulling out each disc. In contrast, the magazines on the Alps and Turtle Beach units have their tabs lined up, so it's harder to get to the middle discs. The Turtle Beach features full audio controls on its front—a nice touch.

We did like these changers, despite their lackluster performance. But with the rapid move from 4X to 6X and 8X in single-disc drives, we suggest waiting for changers with faster mechanisms. The faster (and more expensive) 8X SCSI version of the Nakamichi MJ 4.4, the best of this group, should be available by the time you read this.

HOW DO YOU FEED A MINICHANGER? The Nakamichi (upper left) has no magazine—you just slide discs one at a time into its loading slot. The Pioneer (upper right) uses a big six-disc magazine with convenient staggered finger tabs. The Turtle Beach (lower left) and Alps (lower right) use three- and four-disc magazines, respectively.

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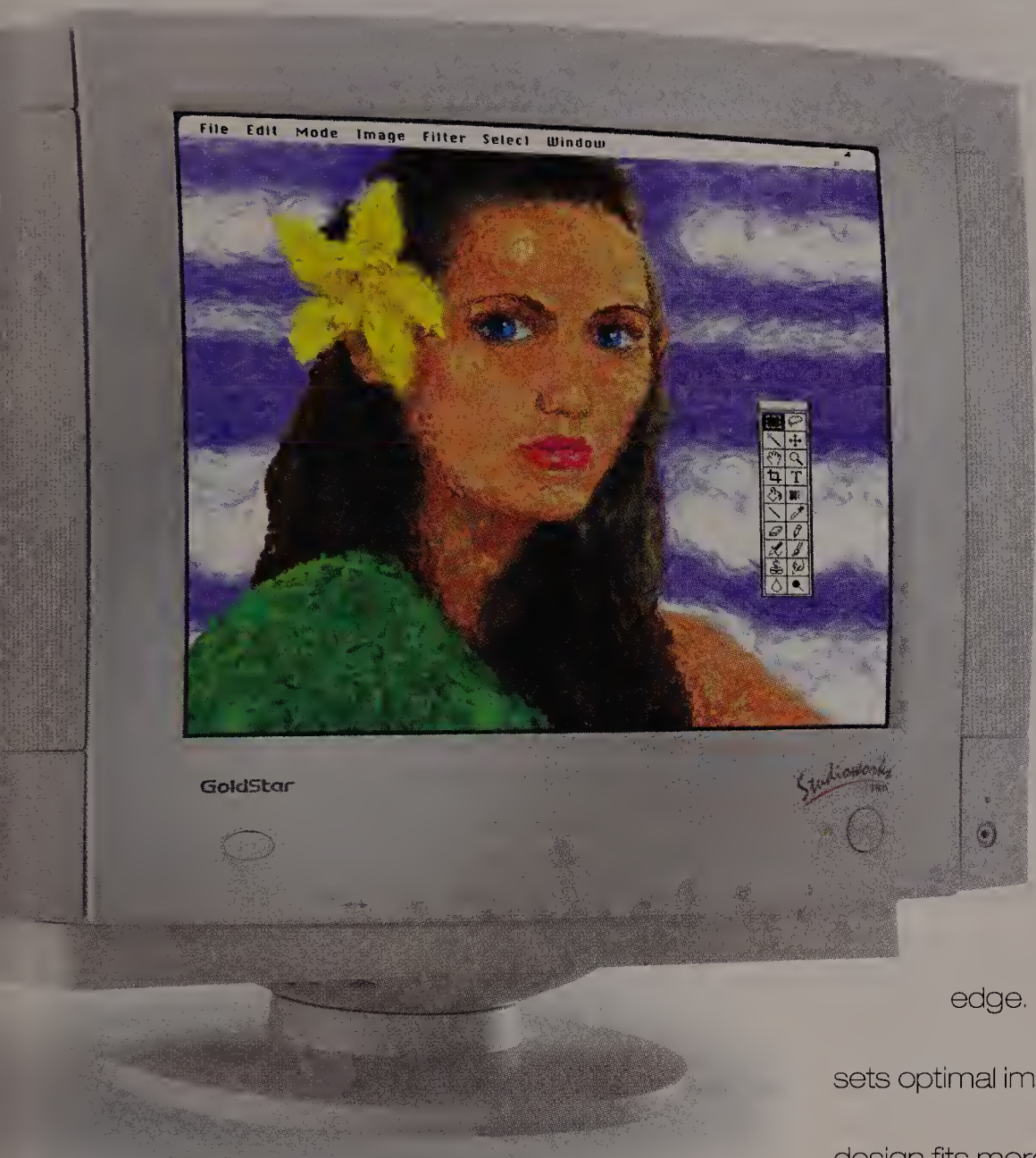

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The Creative Blaster CD 8X EIDE drive has just 6X-level performance at the $250 price of an 8X. Even the bundle of Grolier's Multimedia Encyclopedia, a couple of racing games, and an EIDE card couldn't sell us on this one. We have similar feelings about Philips's Six Speed CD-ROM Drive. Philips has a solid reputation as a developer and manufacturer, and its two-year warranty is exceptional. But this slow 6X EIDE performer includes no software bundle or even an interface card to justify its $250 price. The last three EIDE drives—an 8X from Chinon and two 6Xs from Turtle Beach Systems and Creative Labs—simply cost too much (at about $200) for their slow performance.

LOOKING AHEAD

BY THE TIME YOU read this, 6X and 8X CD-ROM models will be predominant. (Some dirt-cheap 4X bargains will be available, though we wouldn't suggest you buy them.) But at press time 8X drives were still a bit hard to come by. In fact, some of the biggest vendors, such as NEC, Philips, Sony, and Toshiba, ▶

DVD: One Giant Step for CD

NOW THAT CD-ROMS have become indispensable, keep your eyes peeled for the next generation: DVD. Digital video is the driving force behind this new technology, but the same discs will also be used for impressive new DVD-ROM apps. The CD-size discs will pack a formidable 4.7GB—enough to fill seven standard CD-ROMs. Publishers promise silky smooth full-motion video that fills up your whole screen, plus a slew of reference works, training apps, and, yes, games, chock-full of video clips, pictures, and sound.

DVD-ROM drives should play all current audio and video CDs along with today's commercial CD-ROMs. The true transfer rate for CD-ROMs will be about 3X; the drives will get an effective throughput of 9X from DVD-ROMs. But DVD-ROM drives won't read discs written on CD-Recordable drives.

The high capacity alone attracts publishers. Some games, such as Wing Commander IV, now require as many as six CD-ROMs. DVD-ROM developers plan first to enhance popular CD-ROMs with more video and sound. But at press time the DVD spec wasn't yet formalized, and copy protection issues remained unresolved. Still, Activision, SoftKey, and others were readying DVD-ROM releases.

There's general agreement that DVD-ROM will supplant CD-ROM, but even Toshiba predicts the full transition will take at least a couple of years. Some PC industry heavyweights are already laying out their DVD-ROM game plan. Compaq vice president Laurie Frick says her company is committed to making DVD-ROM standard on its high-end PCs by late 1997. But the first EIDE DVD-ROM drives may cost consumers up to $800, so Plextor general manager Dave Butler has reservations about their quick adoption in business: "We don't think the typical business user is likely to buy a pricey DVD-ROM drive until significant business applications are available."

MOVIES ON DVD

THE FIRST DVD PRODUCTS may be strictly for entertainment. At press time movie moguls were hoping to release DVD video discs before year's end. Warner alone has promised to make 50 DVD movies available to play on the first set-top home video units from Toshiba and others. (These set-tops will also play audio CDs but not DVD-ROMs.) Studio execs were tight-lipped about prices. But with the first Toshiba set-top players starting at around $599, DVD looks like an expensive, nonrecordable alternative to the VCR.

But DVD will really improve on video CDs, which have room for about 70 minutes of VHS-quality video and near-CD sound. DVD has room for over two hours of digital video, CD-quality surround sound, multiple language tracks, subtitles, editor's notes, and cast bios. And no longer will you need multiple discs for most movies.

Eventually, DVD disc capacity will grow, first to dual-layer 8.5GB discs and then to double-sided discs holding an amazing 17GB. DVD-Recordable could arrive as early as next year. But even the recordable drives won't have the rerecordable flexibility of a VCR. Ultimately it will take at least a couple of years for a rewritable DVD to make you cart your trusty VCR off to the attic.

IN TIME, DVD MAY SEND CD-ROM THE WAY OF THE MODEL T. Toshiba should be first to market with its set-top DVD video player (right). It will allow you to view movies—such as Warner Brothers' Free Willy 2—in stunning digital video. The DVD player will play audio CDs, but if you want a drive that does it all, including running DVD-ROM and CD-ROM apps, you'll need a PC-based DVD-ROM drive (left).

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TEST REPORT

Plextor 8X and 6X Drives Win on Speed

There's more to CD-ROM performance than speed designations: The best 6X drive outperforms most 8Xs.

Overall performance score	CD-ROM DRIVES AND MINICHANGERS	Drive speed	Interface	Video clip[1]
98	Plextor 8Plex*	8X	SCSI	0
95	Plextor 6Plex*	6X	SCSI	11
89	Diamond Multimedia 8X CD-ROM Upgrade Kit*	8X	EIDE	118
83	GoldStar GCD-R580B*	8X	EIDE	417
83	Teac CD-58E 8X CD-ROM Drive Kit*	8X	EIDE	366
79	Teac CD-56E 6X CD-ROM Drive Kit	6X	EIDE	542
77	Mitsumi FX800	8X	EIDE	671
71	Nakamichi MJ 4.4 (minichanger)	4X	EIDE	454
71	Creative Blaster CD 8X	8X	EIDE	838
70	Mitsumi FX600	6X	EIDE	1041
70	Toshiba XM 5602	6X	EIDE	976
69	Philips Six Speed CD-ROM Drive	6X	EIDE	804
69	NEC MultiSpin 6V	6X	EIDE	880
65	Mitsumi CRMC FX400E (reference drive)	4X	EIDE	706
64	Turtle Beach TBS-6001	6X	EIDE	1040
64	Aztech Zeta 6X	6X	EIDE	738
64	Chinon Systems 8X-Speed CD-ROM Drive	8X	EIDE	978
62	Turtle Beach TBS 3000 (minichanger)	4X	EIDE	996
60	Alps CD544C (minichanger)	4X	EIDE	957
59	Creative Blaster CD 6X	6X	EIDE	966
57	Pioneer DRM62AX (minichanger)	4X	SCSI	1062
39	NEC MultiSpin 4X4 (minichanger)	4X	EIDE	1631

*Best Buy

Corel Pro Photo CD slide show · Bookshelf 95 text search · SmartSuite 96 installation · TurboTax 95

Drives are arranged in order of overall performance from best to worst, based on the normalized, weighted scores from five tests. [1] Frames dropped out of 2194 total.

HOW WE TEST We use Compaq Deskpro P-133 PCs with Plug and Play BIOS, Windows 95, 16MB of RAM, a Matrox MGA Millennium graphics card, and a Creative Labs Sound Blaster AWE32 sound card. Each drive and adapter (if applicable) is installed according to the vendor's instructions. Corel Pro Photo CD slide show (26 percent of weighting): We time the display of a slide show of 100 photos. Bookshelf 95 text search (4 percent): We time the search for a text string. SmartSuite 96 installation (11 percent): We time installation of SmartSuite 96 from its CD-ROM. TurboTax 95 (22 percent): We time the automatic start-up from insertion until the welcome screen is displayed. Then running the program from the CD-ROM, we measure the time it takes to load. Video clip (37 percent): Using Win 95's Media Player, we run a 73-second video clip mastered to play 30 frames per second at a 4X transfer rate (600 K/sec). We count the number of frames dropped. Higher overall performance scores are better. Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

didn't have 8X models ready for review.

CD-ROM drives won't rest on their 8X laurels. At press time Pioneer and Pinnacle Micro had each announced products with claimed 10X throughput, and manufacturers are projecting 12X drives for next year. But considering our experience with this review, we remain skeptical of any performance claims until we test the products. ■

Theresa W. Carey is a freelance writer and consultant, and the founder of Alta Business Solutions in Palo Alto, California. Rex Farrance is a senior associate editor for PC World. *Test design and testing by Susan Silvius and Dave Casini of the PC World Test Center.*

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- Microsoft Internet Explorer 2.0
- Microsoft® Phone 1.0

Professional Software Bundle

- Corel WordPerfect Suite: Corel WordPerfect 7; Corel Quattro'Pro 7; CorelFlow 3; Corel Presentation 7; SideKick 95; Dashboard 95; Envoy 7; Netscape (AT&T WorldNet Services); Corel Screen Saver; 150 Fonts; 10,000 Clip Art Images
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Software Suites

Can Corel's super-cheap, Internet-savvy WordPerfect Suite 7 beat Microsoft Office 95 and Lotus SmartSuite 96 at their own game?

Edited by Harry McCracken and Cathy Kenny

REMEMBER *Let's Make a Deal?* Picking a new Windows 95 application suite is kind of like being a game show contestant. Do you swap your nice but unspectacular Windows 3.1 suite for one of the Windows 95 suites concealed behind door number one, two, or three? Or are you better off sticking with the product you already have?

As each of the three major Windows 95 suites have shipped, we've compared them to each other and to their old Windows 3.1 versions. In December 1995 we discovered that the suite behind door number one, Microsoft Office 95, was a nice improvement in some ways, but not compelling enough to make upgrading a must. In May we reviewed the suite behind door number two, Lotus SmartSuite 96. It offers powerful workgroup features, plus friendly database and group-scheduler programs. But its Word Pro is so slow and 1-2-3 so outdated that we had to recommend Office 95.

Behind the third door is Corel WordPerfect Suite 7, the last major office suite to make the move to Windows 95. The successor to Novell's 16-bit PerfectOffice, this package offers a huge assortment of nice applications at a tantalizing price. The $269 street price gets you its core applications: the WordPerfect 7 word processor, Quattro Pro 7 spreadsheet, and Presentations 7 presentation program, plus Starfish's Sidekick 95 personal information manager, CorelFlow 3 for flowcharting, Envoy 7 for electronic document publishing, the Netscape Navigator 2.01 Web browser, the Dash- ▶

COREL TAKES ON MICROSOFT AND LOTUS

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board 95 desktop utility, and a generous helping of clip art and fonts. And the competitive upgrade is only $99—less than half what you'd pay to upgrade to Office 96 Standard Edition.

As if that weren't enough software in one package, Corel offers a $499 version called Corel Office Professional that includes everything that comes with WordPerfect Suite, plus Borland's Paradox database, Novell's GroupWise e-mail and scheduling program, and Corel's own CorelDraw graphics application and InfoCentral PIM. The Pro suite wasn't ready in time for our review, but it should be available when you read this.

DIFFERENT USERS, DIFFERENT BEST BUYS

NOW THAT ALL THREE of the new Windows 95 suites are here, we've picked two Best Buys: Corel WordPerfect Suite and Microsoft Office 95. If you're a Novell PerfectOffice user, the new features in WordPerfect and Quattro Pro, along with the additional applications, are more than enough to justify the WordPerfect Suite upgrade—as long as you have a fast 486 or Pentium system with at least 16MB of RAM. (Anything less, and the applications are too slow.) Easy-to-use Internet tools also make WordPerfect Suite the best choice at the moment for those who expect their suite to be conversant in the ways of the World Wide Web; and given its low price, it's a great deal for anyone who's trying to outfit a PC with good software on a tight budget.

We chose Microsoft Office 95 as a Best Buy for a whole different set of reasons. At a street price of $440 (upgrade $219), it's expensive, but the overall quality of its major applications is easily the highest: Word is the best word processor and Excel the best spreadsheet, and the PowerPoint presentation package and Schedule+ PIM aren't too far behind Lotus SmartSuite's Freelance Graphics and Organizer. Office 95 is also the fastest Windows 95 suite, and its unique Binder is a valuable tool for combining material from several apps into a single master document.

Lotus SmartSuite is still the odd suite out, despite having several high-grade applications—Approach, Freelance Graphics, and Organizer—and much better workgroup features than the competition. The trouble is that SmartSuite doesn't yet come with a 32-bit edition of Lotus's 1-2-3 spreadsheet, so it still feels like a work in progress. Also, its Word Pro word processor lagged behind Word and WordPerfect in both speed and features.

Best Buys: Office 95 and WordPerfect Suite 7

WANT THE BEST OVERALL WINDOWS 95 OFFICE SUITE, regardless of price? Microsoft Office 95 gets our nod as a Best Buy for the high quality of its applications, especially Word and Excel. But if cost is a major factor in your buying decision, consider our other Best Buy, Corel's WordPerfect Suite 7, which provides a remarkable range of apps for a dirt-cheap price. Lotus SmartSuite 96's slow word processor and outmoded spreadsheet keep it out of the running for now.

Corel WordPerfect Suite 7

WHAT'S HOT

Low cost, high value: For as little as a $99 competitive upgrade, you get bushels of useful software.

Tops for cybersurfers: Internet features include an outstanding Web page editor.

QuickTask automation: Clever helpers steer you through everything from tracking investments to designing a greeting card.

WHAT'S NOT

Mediocre performance: Even the 16-bit PerfectOffice is faster at some tasks.

Erratic integration: Core applications work well together, but secondary programs don't.

Group unfriendly: It has the weakest collaborative tools—and lacks group scheduling altogether.

PRICING

Street price: $269; competitive upgrade $99

Corel Corp., 800/772-6735

http://www.wordperfect.com

Reader service no. 814

Lotus SmartSuite 96

WHAT'S HOT

Collaborative clout: Best features by far for users who work together on documents.

First-rate presentation and PIM apps: Freelance makes quick work of screen shows, and the 16-bit Organizer remains the most inviting address book-calendar.

Approach is standard: There's no need to buy a costly "Pro" suite to get a database.

WHAT'S NOT

1-2-3 needs updating: A 32-bit version won't arrive until later this year.

Slow word processor: Word Pro suffers from molasseslike performance.

Parsimonious phone support: Only the first 60 days are free; Corel and Microsoft offer lifetime free help.

PRICING

Street price: $399; competitive upgrade $149

Lotus Development Corp., 800/343-4514

http://www.lotus.com

Reader service no. 815

Microsoft Office 95

WHAT'S HOT

World-class word processor and spreadsheet: Word and Excel take top honors in these two vital categories.

Relatively good performance: Office is the quickest of the three Win 95 suites.

Easy integration: The Binder lets you combine material from all the Office 95 apps.

WHAT'S NOT

High price: Both SmartSuite and WordPerfect Suite are much less expensive.

Fewest extras: Office 95 doesn't provide much more than its four core programs.

Lacks standard Internet features: Most Web tools are add-ons.

PRICING

Street price: Standard Edition $440; competitive upgrade $219

Microsoft Corp., 800/426-9400

http://www.microsoft.com/msoffice

Reader service no. 816

For information about all suites, circle reader service no. 913.

SOFTWARE THE COREL WAY

COREL, WHICH ACQUIRED PerfectOffice from Novell in March 1996, has been quick to put its own mark on the redubbed suite. Best known for its feature-rich CorelDraw graphics package, the company has added so many new items that you would need more than 400MB of free disk space to install everything, compared with about 89MB for Microsoft's suite and 140MB for Lotus's; a more typical installation will eat up about 200MB.

WordPerfect Suite is full of useful software, but Corel hasn't melded all of these appealing apps into a coherent whole. As we discuss in "WordPerfect Suite Integration: A Mixed Bag," this product really consists of a well-integrated suite of three core applications—WordPerfect, Quattro Pro, and Presentations—accompanied by a bundle of stand-alone programs. A more bizarre imperfection is that the suite's manual refers at length to a Workflow Manager feature that's designed to let you route documents around a network. This sounds like it might give SmartSuite's groupware tools a run for their money. The problem is that Corel decided to remove Workflow Manager at the last moment and has no plans to restore it in the future.

WHERE'S THE SPEED?

OFFICE 95 IS the fastest 32-bit suite we've tested, but that's not saying much. None of the suites made striking speed gains on their 16-bit predecessors, except in a few isolated areas such as Office 95's and SmartSuite's much faster presentation printing. Corel's Presentations 7 prints only marginally faster than before—the biggest reason why WordPerfect Suite is the slowest of the suites we reviewed. The news is also bleak for current Novell PerfectOffice users: On a Pentium or 486DX2-66 system with 8MB of RAM, the 32-bit WordPerfect Suite is slower than the 16-bit PerfectOffice, whether you're running PerfectOffice under Windows 3.1 or Windows 95. With 16MB of RAM, WordPerfect Suite gains a modest edge over its 16-bit forebear under Windows 3.1.

It's a shame that WordPerfect Suite isn't faster and a bit more polished. We'd also like to see Corel promote the Sidekick 95 PIM to full status as a better-integrated core application. But considering the good quality of most of its programs, its lead in Internet functions, and its affordable price, WordPerfect Suite will fit many users' needs.

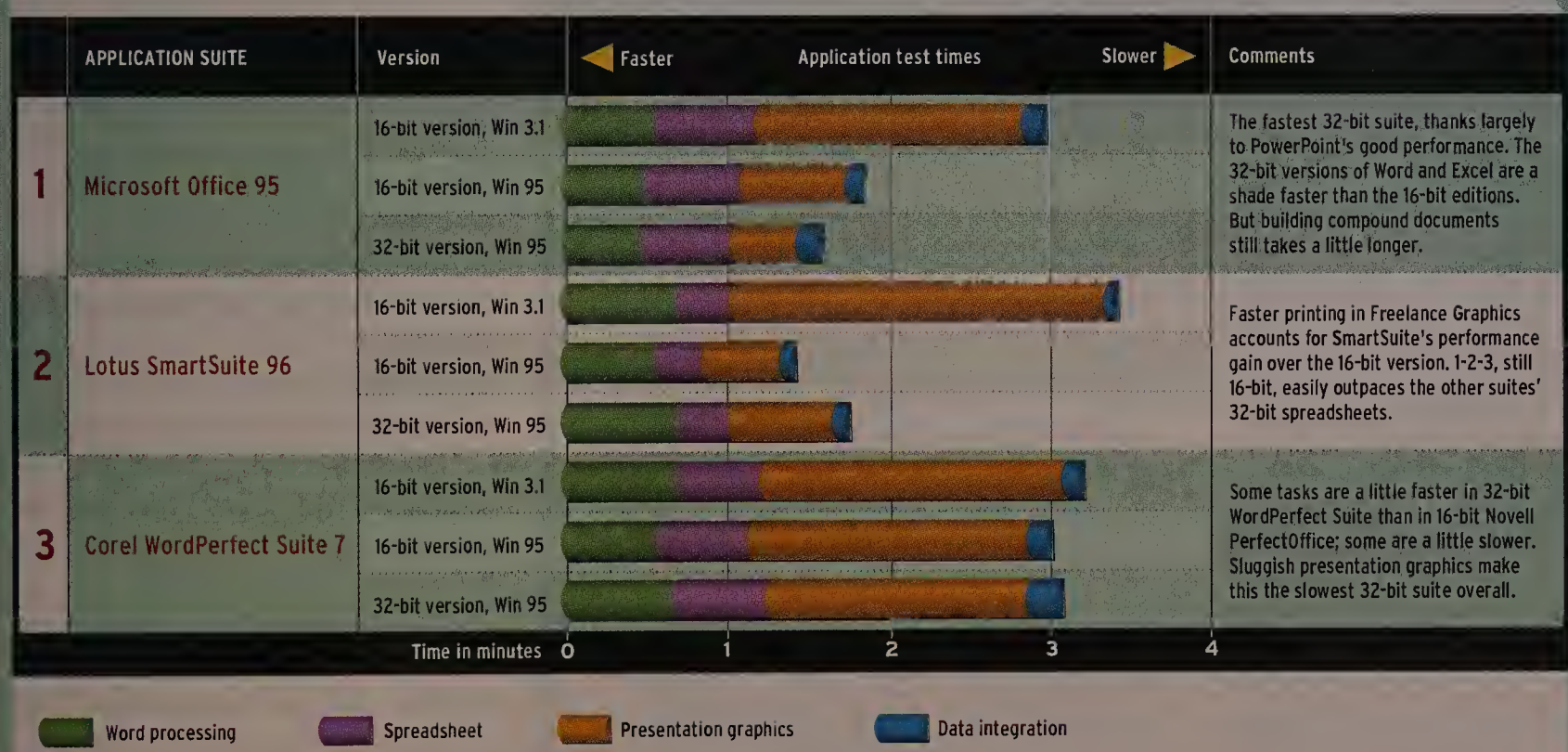
WHAT'S NEXT IN SUITES

WORDPERFECT SUITE MAY BE the newest suite in town, but that won't last for long. As we go to press, Lotus and Microsoft are readying the next versions of their suites for release by the end of 1996. Lotus's new version of SmartSuite will finally incorporate 32-bit editions of 1-2-3 and the Organizer PIM. And based on the previews we've seen, Microsoft's Office 97 may provide stiff competition for WordPerfect Suite's Internet features: It adds a slew of new Internet tools and replaces Schedule+ with Outlook, a new workgroup information manager with Web features. ▶

TEST REPORT

Windows 95 Software Suites

32-bit architecture is no guarantee of fast performance.

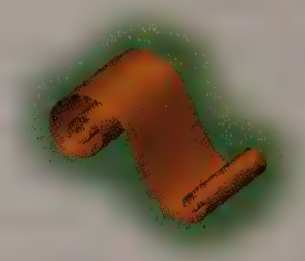


HOW WE TEST Tests were conducted on a Micron Millennia Pentium-90 with 16MB of RAM, an 850MB hard disk, and a Diamond Stealth64 graphics controller with 2MB of RAM. Tests were performed by hand. Timing ended when we regained control of the cursor. **WORD PROCESSING:** We loaded a 50-page document and performed formatting, editing, and searching tasks; the printing test timed output of a 20-page document. **SPREADSHEET:** We loaded a file composed of 10 linked worksheets. We then changed a cell value and timed how long it took for a linked cell on another sheet to recalculate. We also sorted a 2000-record table and filtered the table for a 50-record subset. **PRESENTATION GRAPHICS:** We loaded a 45-slide presentation and loaded a slide with a linked spreadsheet. We then viewed the slide show on screen and printed a 45-slide presentation with no build effects. **DATA INTEGRATION:** Operations included editing a spreadsheet link from within a word processing document and importing a 50-record subset from a 2000-record database file. Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

Both Corel and Lotus are also planning innovative offshoots from their suites for 1997. Corel is working on a version of its suite written entirely in the Java programming language; it's meant primarily for use on a number of upcoming low-cost computers that don't work with Windows, but can run Java apps. Lotus, which has criticized the huge size of today's suites, is introducing Lotus Components, a series of compact applets with fewer tools than their suite equivalents. The first ones are designed for use with the company's Notes groupware system, but Lotus plans to release more general-purpose ones eventually.

Will these future products really impact the way you write business documents, crunch numbers, put together slide shows, or keep your schedule under control? Stay tuned for our reports in future issues of *PC World*.

Jeff Bertolucci, Richard Jantz, and Peter Scisco are freelance writers. Cathy Kenny is an associate editor, Harry McCracken a senior associate editor, and George Campbell and Richard Scoville contributing editors for PC World. *Performance testing conducted by Kevin Mitchell and the PC World Test Center.*



WORDPERFECT 7: SAME FEEL, NEW FEATURES

WHAT'S HOT: Draggable guidelines and other formatting tools, easy Web page editing, fast QuickFinder file searching, real-time spelling checker, improved revision tools.

WHAT'S NOT: Slow performance, clumsy style editor, no autoformat feature.

WordPerfect users have waited longer than anyone for a Windows 95 version of their favorite word processor. Those devotees will find that although WordPerfect 7 maintains the basic personality of earlier versions, it's full of clever new features. The changes aren't radical enough for it to overtake Microsoft Word 7.0 as best all-around Win 95 word processor, but WordPerfect 7 is certainly a worthwhile upgrade for users of version 6.1, as long as they've got Pentium PCs with 16MB of RAM.

Upgraders and other prospective WordPerfect 7 buyers should note that Corel has stopped selling it as a stand-alone product, except under special licensing agreements for corporate users.

NEW FORMATTING AND EDITING TOOLS

UNLIKE LOTUS'S WORD PRO, WordPerfect doesn't introduce fundamental design changes. Still, as soon as you load the program, you'll notice enhancements aimed at making formatting and editing easier. The new Guidelines feature shows margin, table, and column positions as dotted-line overlays on your document. You just drag the lines to reposition them; the new dimensions appear as you drag. Neither Word or Word Pro provide a similar tool for changing margin settings.

Another innovative touch: A small icon called a QuickSpot appears next to text, tables, graphics, and other elements as you move the cursor over them. Click on a QuickSpot to pop up an all-in-one toolbox for formatting the item. Word 7 doesn't have such a feature, and Word Pro's floating InfoBox, while very useful, is so large that it gets in the way at times.

WordPerfect now checks your spelling as you type. Misspelled words are underlined with wavy red lines just as they are in Microsoft Word. To correct the misspelling, you just right-click the mouse and choose the correct spelling.

As with WordPerfect Suite's other core programs, WordPerfect 7 sports top-notch tools for creating and editing World Wide Web pages. A QuickTask expert walks ▶

PETER COATES

The Top Applications in the Suites

Among the biggest considerations in choosing a suite are the specific applications you spend most of your time working in. Tempted to buy your favorite apps and assemble your own suite? Even at discounted street prices, doing so could cost you more than $1000. Our ratings cover the three basic suites, not the additional features found in Microsoft's Office 95 Professional or Corel's Office Professional 7.

Application	Rankings and comments
Word processing	**BEST:** Word 7.0 (Office 95). Still has a clear lead in features, ease, and speed. **RUNNER-UP:** WordPerfect 7 (WordPerfect Suite 7). **THIRD PLACE:** Word Pro 96 (SmartSuite 96).
Spreadsheet	**BEST:** Excel 7.0 (Office). The most impressive blend of usability and advanced number crunching. **RUNNER-UP:** Quattro Pro 7 (WordPerfect Suite). **THIRD PLACE:** 1-2-3 version 5.01 (SmartSuite).
Presentation graphics	**BEST:** Freelance Graphics 96 (SmartSuite). SmartMasters let you quickly assemble a slick show. **RUNNER-UP:** PowerPoint 7.0 (Office) **THIRD PLACE:** Presentations 7 (WordPerfect Suite)
Database	Approach 96 (SmartSuite). Friendly and fairly powerful, it's the only database included with an entry-level suite.
Personal information management, group scheduling	**BEST:** Organizer 2.1 (SmartSuite). A bit long in the tooth, but it's powerful, and its notebook interface is easy to use. **RUNNER-UPS (tie):** Sidekick 95 for PIM functions (WordPerfect Suite); Schedule+ 7.0 for group scheduling (Office).
Other applications	**BEST:** WordPerfect Suite, no contest. It gives you flowcharting, electronic publishing, a Web browser, and other nice extras. **RUNNER-UP:** SmartSuite. **THIRD PLACE:** Office.

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intel inside pentium PROCESSOR

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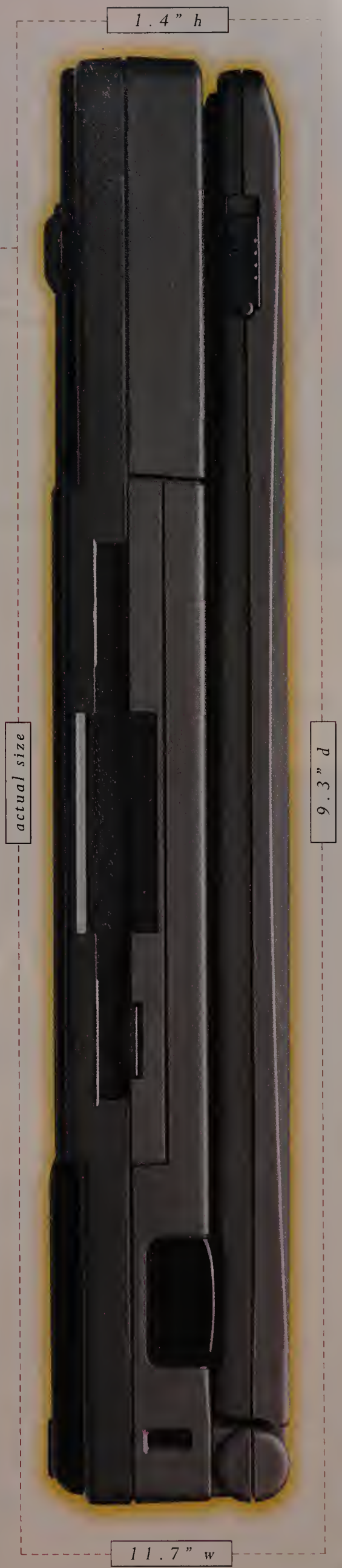

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you through creating basic Web pages and shields you entirely from the complexities of HTML coding; or you can convert any existing document into a Web page. You can also open existing Web pages within WordPerfect and add links to Web addresses within any document.

OLD FEATURES MADE BETTER

THE UNIQUE QUICKFINDER full-text searching system now uses Windows 95 multithreading so it can index files unattended in the background. Once your hard disk has been indexed, searching is remarkably fast; the range of options, including the ability to search for synonyms of words in a document's text, beats those in Word and Word Pro.

Table tools, always one of WordPerfect's strong points, now give you the ability to rotate text in cells, with the cell automatically adjusting in height. Word can't do this at all, and Word Pro forces you to set the table height manually.

ROOM FOR IMPROVEMENT

WORDPERFECT'S TOOLS FOR EDITING paragraph styles remain clunky: They force you to use arcane codes, and you can't preview the end results. There's no equivalent to Word's AutoFormat feature or Word Pro's Check Format tool, both of which analyze documents and apply formatting for you. You can use its grammar checker to perform some of the same tasks, but it's a slower and less straightforward solution.

Workgroup users will find that WordPerfect 7 has better collaborative tools, but it still can't match Word and lags far behind Word Pro. Individual editors can mark up the same file using different colors, and there's a new highlighter tool. However, security controls for specifying who can edit a document are limited, and the program lacks the routing features that are described in its documentation; Corel dropped them at the last moment.

On the performance side, the application runs acceptably on a fast Pentium PC, especially if you have 16MB or more of RAM. But WordPerfect 6.1 users who upgrade to this version in hopes of better overall speed will be disappointed: In our benchmark tests, some tasks, such as loading a document, were quicker, but others, including search and replace, had slowed down. WordPerfect 7 is considerably slower than Word 7.0, but it beats Word Pro by a narrow margin in most areas.

WORDPERFECT'S NEW FORMATTING TOOLS include draggable guidelines and all-in-one formatting toolboxes that are specific to the object you are editing.

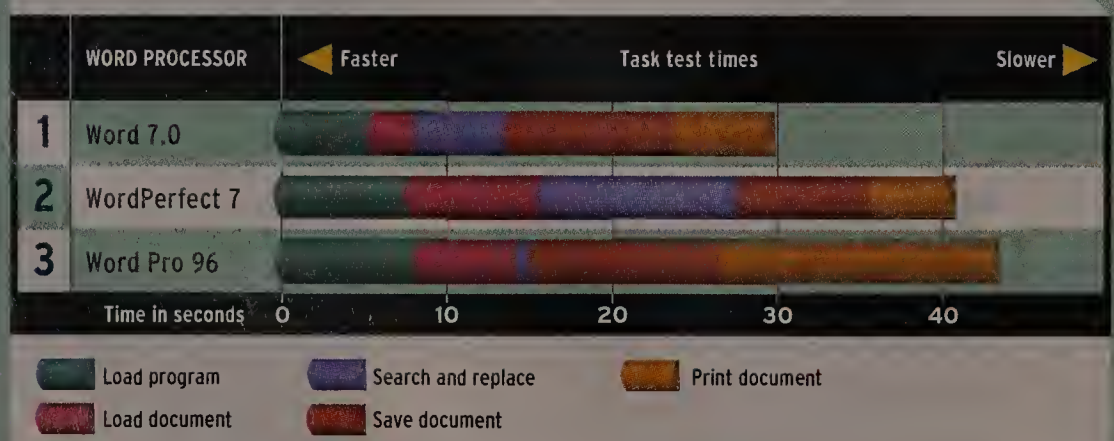
THE BOTTOM LINE

EVEN WITH THE PERFORMANCE hit, upgrading to version 7 makes sense if you're a dedicated WordPerfect user and your PC is up to the task: The new editing, formatting, and revision-marking features are reason enough. But for those who aren't already committed to WordPerfect, Microsoft Word 7.0 is clearly the top choice among Windows 95 word processors; it's got a blend of features, usability, and performance that neither WordPerfect nor Word Pro can match. —*George Campbell*

TEST REPORT

Word 7.0 Is Fastest

For most major tasks, it outpaces WordPerfect and Word Pro.



HOW WE TEST For methodology, see "Test Report: Windows 95 Software Suites." Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

QUATTRO PRO 7: EXCEL GAINS A RIVAL

WHAT'S HOT: Formula Composer, which makes constructing formulas easy; Web connectivity, a mapping utility, and a slide-show producer.

WHAT'S NOT: Slow recalculation, clumsy Data Modeling Desktop, insufficient workgroup tools.

Quattro Pro has suffered its share of travails. Its ownership has changed hands three times in rapid succession, and it's never gained the name recognition of Excel or 1-2-3. But the new Windows 95 release of this stalwart spreadsheet packs excellent value. With a bevy of new functions and more graphics tools—plus Internet connectivity—it ranks a close second to Excel overall and finishes far ahead of 1-2-3 release 5's poor third-place showing. Quattro fans should upgrade—as long as they already have fast PCs with at least 16MB of RAM. ▶

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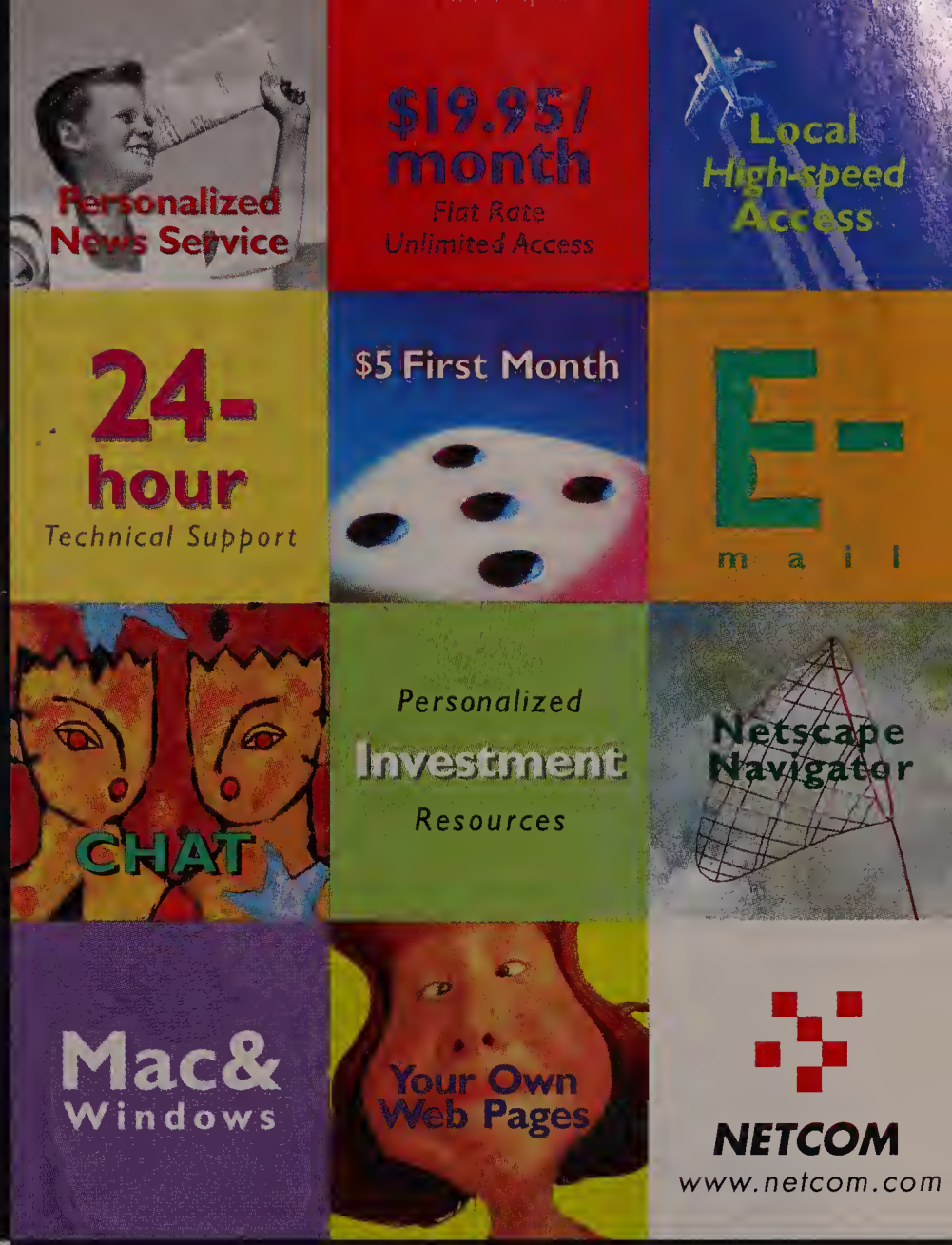

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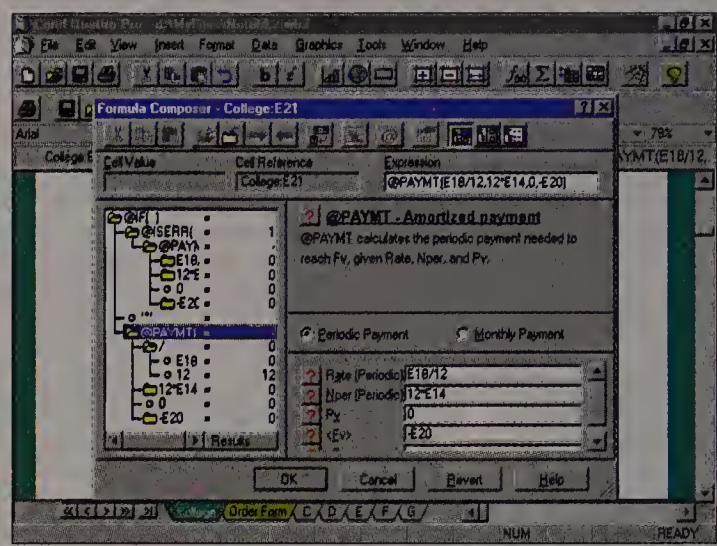
MORE FUNCTIONS, EASIER FORMULAS

A SPREADSHEET'S MISSION is to analyze and present data. Although Excel remains the analytic champion, Quattro Pro 7 is no slouch. It has more than a hundred new functions, adding valuable tools such as subtotals and array functions to create live frequency distributions and to calculate the return on nonperiodic cash flows. Another compelling feature is the Formula Composer, which lets you view a formula in outline form, with individual expressions displayed hierarchically so you can see how they work. For our money, this is the first formula construction aid that really works.

Graphics have always been a Quattro Pro strong suit, and the program's unique slide-show capability has emerged as a presentation tool, complete with customizable page layouts and transition effects. The program also has a mapping module that lets you display your data geographically: It's a bit more capable than 1-2-3's mapper but less versatile than Excel's.

World Wide Web integration is now a fundamental part of Quattro Pro. The most intriguing Web feature is the ability to create spreadsheet formulas that pull data from a Web page. You might use this trick to set up financial calculations that use prices from a sales catalog stored on the Web.



COMPLEX FORMULAS ARE EASY TO CONSTRUCT and decipher with Quattro Pro's new Formula Composer.

WHAT'S MISSING

FOR ALL ITS VIRTUES, Quattro Pro falls short of Microsoft Excel 7 in some important respects. For instance, Excel's Outlines, Subtotal Wizard, and AutoFiltering commands have no real equivalent in Quattro Pro. In other cases, Quattro's implementation of a ▶

WordPerfect Suite: Your Best Bet for the Net

WITH THE CURRENT EXPLOSION of interest in all things online, the big three suite developers have been scrambling to enable their applications for the Internet by adding World Wide Web browsers, the ability to save files for easy posting on the Web, and tools for embedding links to Web sites in documents. Which current Windows 95 suite provides the best Internet features? Corel's WordPerfect Suite 7 wins hands down, with an easy-to-use yet sophisticated set of Internet tools.

WordPerfect Suite comes with Netscape Navigator 2.01, the world's most popular Web browser. (Note: International Data Group, *PC World*'s parent company, is a minority shareholder in Netscape Communications.) It integrates Navigator with its other applications in several ways. For example, you can launch the browser from an icon in WordPerfect, Quattro Pro, or Presentations, or summon an automated QuickTask that uses Navigator to retrieve Wall Street data, which you can then analyze in a Quattro Pro spreadsheet.

Office 95 now includes Microsoft's Internet Explorer browser but doesn't go nearly as far in linking it with the suite's other applications. And while Lotus's SmartSuite comes with a browser from Internet service provider Global Network Navigator, the browser's setup program lets you connect to the Net via GNN only.

Internet Without Agony

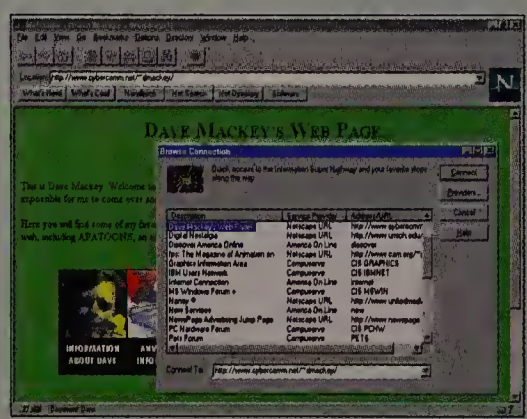
IF YOU WANT TO CREATE WEB PAGES, any of the three suites can handle the job—but WordPerfect Suite offers the widest range of possibilities. (See our reviews of WordPerfect, Quattro Pro, and Presentations for details on what you can do.) In particular, WordPerfect's Web-page QuickTask is a much better introduction to creating basic Web sites than anything that Word and Word Pro have to offer.

Both WordPerfect Suite and SmartSuite offer a big advantage over Office 95: All of their Internet capabilities work right out of the box. Microsoft shipped its suite in August 1995 before it had finished the Internet features. Although Office 95 now ships with an add-on Internet Assistant for Word, you have to download a confusing array of additional utilities from the company's Web site, including separate Internet Assistants for Access, Excel, PowerPoint, and Schedule+.

Another feature of WordPerfect Suite that the other packages can't match is its QuickConnect utility. QuickConnect automatically scours the communications software on your hard disk, collecting data such as your Netscape Navigator Bookmarks and CompuServe Information Manager Favorite Places. It then provides a convenient scrolling list of all your favorite online haunts. Click on any location, and it launches the appropriate service and takes you there.

In short, WordPerfect Suite is currently your best choice for Internet access, but this situation could change quickly. For starters, Microsoft is planning to add lots of new Internet features to its next version of Office, which is due late in 1996. This upgrade will incorporate all of the Internet Assistant add-ons as standard features. And though Lotus has not disclosed its Internet plans for future versions of SmartSuite, it's highly likely that Lotus will also try to challenge WordPerfect Suite's reign as the champ of cyberspace.

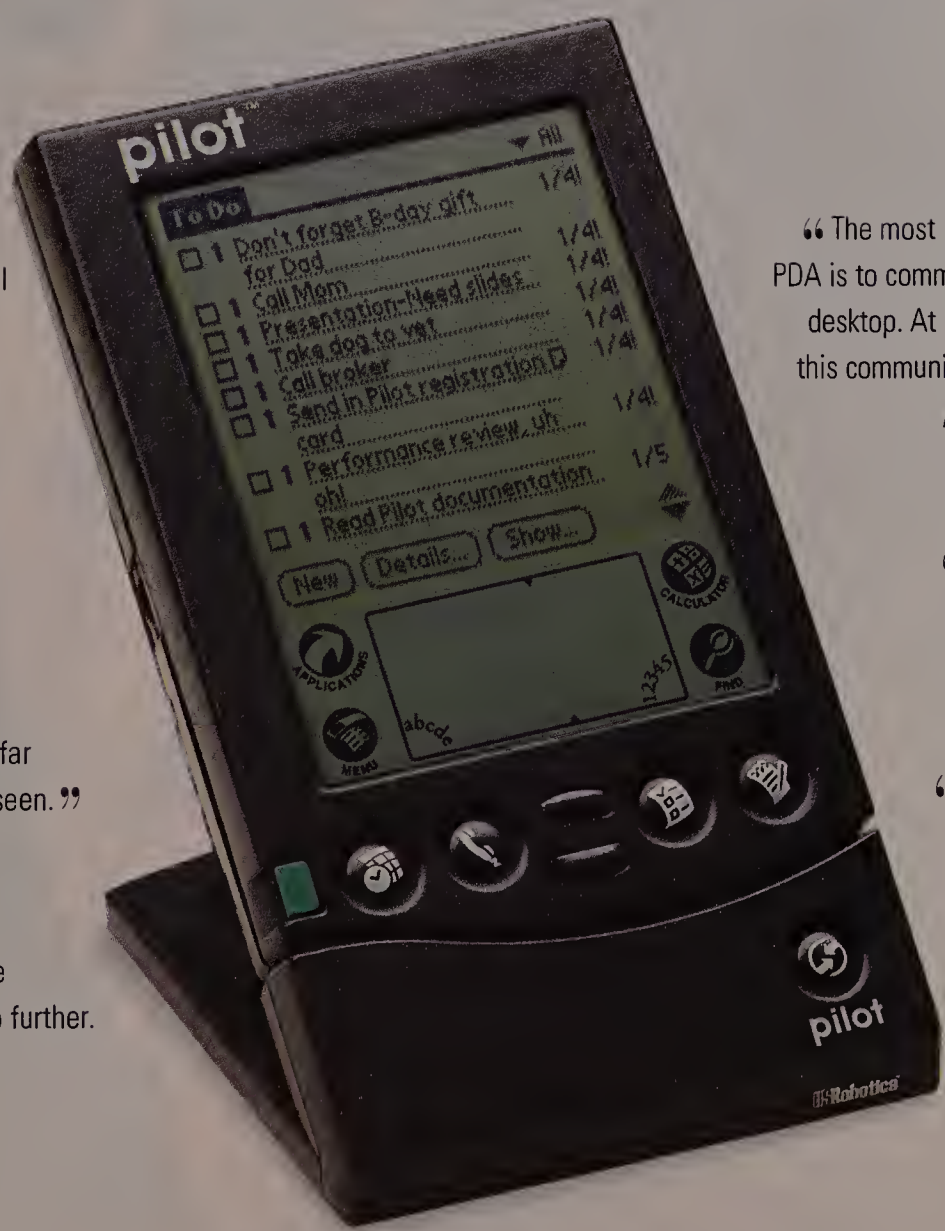
—*Jeff Bertolucci*



WORDPERFECT SUITE'S QUICKCONNECT automatically keeps track of your favorite Web, CompuServe, and AOL locations.

PETER COATES

It even gets people to agree.



"One of the most thoughtfully designed personal digital assistants on the market."

Windows Sources

"Windows Stellar" APRIL 1996

Windows Sources

"A breakthrough product...by far the best little computer I have ever seen."

Wall Street Journal

"If you're searching for the ultimate palm-size organizer, look no further. ★★★★★"

PC Computing

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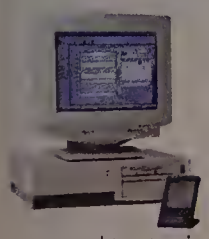
San Jose Mercury News

"A little dynamo."

Business Week



But don't take their word for it. Try Pilot out for yourself and see what everyone's raving about. Pilot is the only truly connected organizer—complete with everything you need to stay in sync with your PC. At just over 4.5" and at $299,* it's the only pocket organizer that fits your shirt pocket and your pocketbook. And the only one versatile and powerful enough to get this kind of consensus. To find out where to get your hands on one, call 1-800-881-7256. To arrange a demo, visit our web site at http://www.usr.com/palm.

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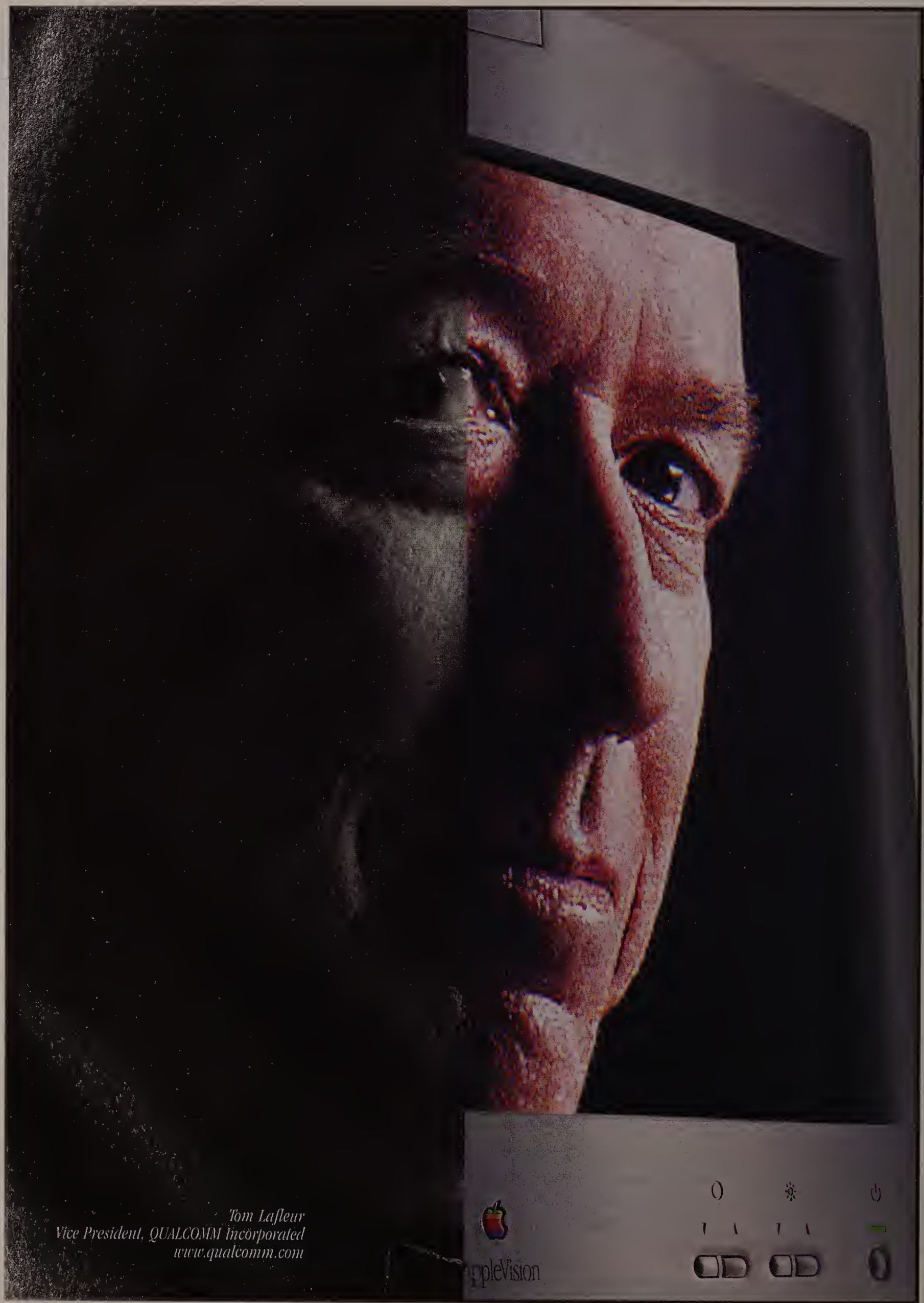
Circle 173 on reader service card



Tom Lafleur
Vice President, QUALCOMM Incorporated
www.qualcomm.com

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THERE'S A PLACE WHERE WALLS BETWEEN OFFICES ARE REPLACED BY WORDS.

Where questions never go unanswered.
Where the people you need to find can always be found.

Where information forever eludes the bottleneck.
And misunderstanding has taken a leave of absence.

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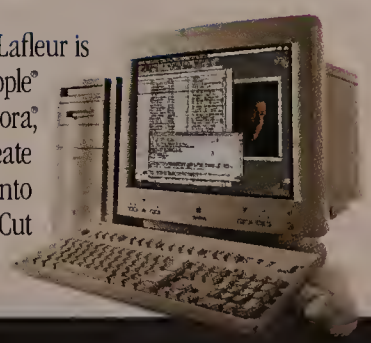

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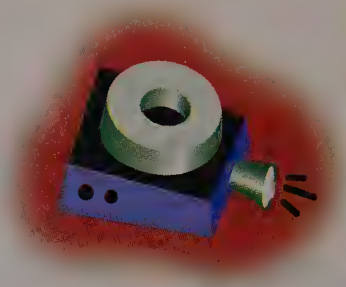
feature is just not as thorough as Excel's. Quattro's Data Modeling Desktop, which lets you summarize a list of data in cross-tabular fashion, is really no match for Excel's Pivot Table command; the Data Modeling Desktop is a separate application that offers only clumsy connections back to the source data.

Another area where Quattro Pro fails to deliver is in workgroup features: 1-2-3 is still the spreadsheet to beat in this arena. As with Excel, in Quattro Pro you can send only an entire workbook via e-mail; you can't select a particular sheet or range. And unlike both its competitors, Quattro Pro doesn't let you route a workbook to a sequence of users; you can send it only to a group of users all at the same time.

In our performance tests, the 32-bit Quattro Pro 7 was slightly slower than the 16-bit version of Quattro running under Windows 3.1. Following in the unfortunate tradition of its predecessor, version 7 recalculated spreadsheets very slowly compared to 1-2-3 and Excel. However, it handled other tasks quickly enough (on a Pentium or 486DX2-66 PC with 16MB of RAM) to finish in a near-tie with Excel 7.0 for overall performance. Ironically, Lotus's lowly 16-bit version of 1-2-3 was much faster than the 32-bit Excel and Quattro Pro.

WHEN TO CHOOSE QUATTRO PRO

QUATTRO PRO 7 will be welcomed by current users, but if you're an Excel aficionado or even a 1-2-3 pioneer, don't bother switching. Excel still maintains a lead over Quattro Pro, and 1-2-3 users will want to stick around for Lotus's 32-bit version of its spreadsheet, due to hit the market this fall. But if you need a low-cost alternative to Microsoft Office 95 and Excel, Quattro Pro—part of WordPerfect Suite—is your best bet. Corel also sells it as a stand-alone package for a street price of about $66. —*Richard Scoville*



PRESENTATIONS 7: BETTER DELIVERY, WEAK PERFORMANCE

WHAT'S HOT: Internet features, screen show enhancements.

WHAT'S NOT: Poor performance, so-so content templates.

Want to create slide shows that you can put on the Web for the whole world to see? The strong Internet features of Presentations 7 may make it the package for you. But if ease of use and performance are more important, the Win 95 versions of Lotus's Freelance Graphics and Microsoft's PowerPoint are better choices.

Presentations 7 retains some unique features from previous versions, including professional-strength drawing and bit map–editing tools. The most notable improvement in this version is that it can publish presentations in HTML format so you can incorporate them into Web sites. With a few simple clicks you can convert your slide shows into single, multiple, or frame-enhanced Web pages with graphics.

The program's screen-show effects have been bolstered, too, with the addition of object and text animation, more transitions, and interactive links; for example, you can play a sound or video clip or launch other applications. However, adding these effects isn't nearly as quick and easy as it is in PowerPoint.

PRESENTATION HELP WANTED

OF COURSE, THE REAL GRUNT WORK in producing a presentation is putting the content together, arranging its order, and rehearsing the show. Unfortunately, life in the trenches hasn't gotten much ▶

WordPerfect Suite Integration: A Mixed Bag

LIKE A TEAM OF CIRCUS ACROBATS, a software suite is supposed to be a tightly knit family that juggles data back and forth in perfect harmony. And if you judge only WordPerfect, Quattro Pro, and Presentations, WordPerfect Suite 7 keeps pace with the competition for overall integration. These three apps have similar interfaces and share many features, including the QuickFinder search tools, Envoy electronic publishing, and a help system that lets you find answers by posing plain-English questions ("How do I format a table?"). Learn any one of these programs and you're well on your way to knowing the others—a key virtue of any office suite.

WordPerfect Suite doesn't include an equivalent of Microsoft's Binder, the Office 95 feature for combining material from several applications into a single compound document. But since Word Perfect, Quattro Pro, and Presentations (as well as the CorelFlow flowcharting program) all provide good support for OLE 2.0, it's reasonably easy to share data between them. For instance, bringing some numbers from a Quattro Pro spreadsheet into a Presentations slide show is as simple as highlighting the desired range in Quattro and dragging it onto your Presentations slide.

The core programs also give you QuickTasks, a set of wizard-style automated helpers that you select from one easy-to-use browser. Each QuickTask launches one or more applications and steers you through a project, such as creating expense reports, investment summaries, greeting cards, or even Web pages.

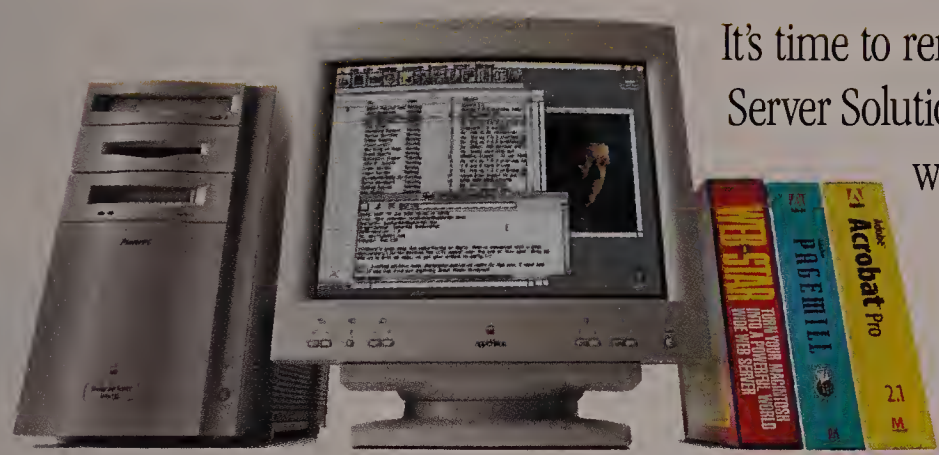
Not So Suite

ONCE YOU VENTURE OUTSIDE the confines of its core applications, WordPerfect Suite is a hodgepodge. All of the bonus programs are second-class citizens: User interfaces and menu structures differ; and you don't get any special tools for sharing data between programs. Of course, all Windows software behaves enough alike that it's not too hard to get up to speed with the secondary apps, and you can always use the Clipboard to exchange data.

Ultimately, there's no clear integration leader among the three suites. The data-exchange tools don't differ radically from suite to suite, and each product has at least one unique and useful trick up its sleeve. In a perfect world, you'd be able to buy a single office suite that offered WordPerfect Suite's QuickTasks; Office 95's Binder; and SmartSuite's SmartCenter, the most functional and friendly toolbar for launching applications and performing other suite tasks.

PETER COATES

START REPLACING WALLS WITH WORDS.



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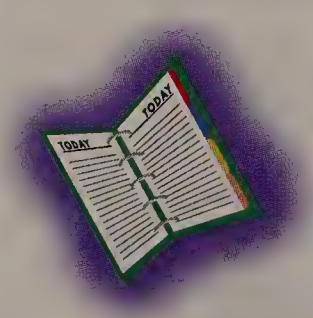
easier for Presentations 7 users. For example, nothing new has been added to PerfectExpert, Presentations' automatic content feature; it still provides suggestions on only four topics. In contrast, Freelance now offers canned content on more than 30 topics. Still missing is a rehearsal mode for practicing your delivery and timing—an invaluable feature that both Freelance and PowerPoint provide. We've also seen better cross-application integration: You can't quickly export speaker notes and slides into a WordPerfect document, as you can from PowerPoint to Word.

Worst of all, our performance benchmarks reveal that Presentations 7 doesn't seem to benefit much from 32-bit processing. Printing is a particularly sore point: When we told Presentations to print our test slides on a Pentium with 16MB of RAM, it took more than a minute before we regained control of the PC. By comparison, Freelance took less than 20 seconds, and PowerPoint took just a second and a half. Whether we used a 486 or Pentium PC, with either 8MB or 16MB of RAM, we found that Presentations is slower for many tasks than its 16-bit predecessor.

FREELANCE GRAPHICS KEEPS ITS LEAD

OF THE THREE SUITE-BASED presentation programs, Freelance Graphics 96 is still the best all-around choice. Its unique team-computing tools also make it the best option when several users need to collaborate on a slide show. PowerPoint 95 is a great pick for creating lively screen shows, and it's a close second to Freelance Graphics. As praiseworthy as Presentations 7's Internet features and graphics-editing tools are, its poor performance and outdated presentation-authoring options leave this upgrade in third place. Corel also sells Presentations 7 as a stand-alone product for a street price of around $66. —*Richard Jantz*



SIDEKICK, DASHBOARD, AND THE KITCHEN SINK: ON THE OUTSIDE LOOKING IN

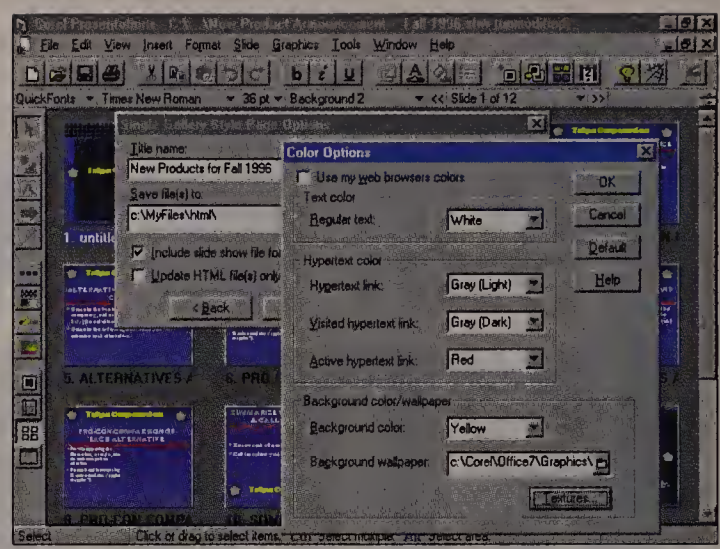
WHAT'S HOT: Sidekick is a capable stand-alone PIM; WordPerfect Suite includes a variety of other useful software.

WHAT'S NOT: Applications suffer from a lack of integration; Sidekick has no workgroup scheduling.

With most suites, once you get past the word processor, spreadsheet, presentation package, and PIM—and perhaps a database—you've seen just about everything. Not so with WordPerfect Suite 7, which includes not only Starfish's Sidekick 95 PIM but also a smorgasbord of other tools and utilities. Most of these apps do what they're supposed to; if you look at them simply as a diverse library of items at a rock-bottom price, you'll likely come away satisfied. But it's unfortunate that these programs aren't more closely interlinked: By today's standards, a bunch of appealing software on a CD-ROM does not a suite make.

OUT WITH THE OLD, IN WITH THE NEW

ONE OF THE BIGGEST CHANGES in WordPerfect Suite is that PerfectOffice's InfoCentral, a powerful but complex personal information manager, has been passed over in favor of Sidekick 95, a traditional PIM that competes more directly with Schedule+ and Organizer. It doesn't, however, offer their group-scheduling features for networked users; for those, you'll need Corel Office Professional, which comes with Novell's capable GroupWise e-mail and scheduling client.



WITH PRESENTATIONS' SLICK INTERNET TOOLS, you can convert slide shows into Web pages, complete with control over colors and graphics, and publish them to your Web site.

Sidekick's simple interface and versatile tools make it a good choice for individuals who need to manage their appointments, to-do lists, and other personal data. Unlike many PIMs, it lets you create templates to hold all kinds of data in addition to addresses, and also includes an expense tracker for logging expenditures on the road. But where Sidekick gets short shrift is in the way it's ignored by WordPerfect Suite's other applications. For instance, while Office 95 lets you insert address data from Schedule+ into Word 95 documents, WordPerfect expects you to use Address Book—a separate application—instead of Sidekick.

Another unexpected change is that the Desktop Application Director toolbar, better known as DAD, is no longer a customizable, floating home base for all your suite-related activities. It now sits anchored to the Windows 95 Taskbar and merely acts as a launch pad for some, but not all, of the suite's applications. You also get Dashboard 95, a desktop manager that provides quick access to applications and files and monitors system resources and print queues. You can replace the new DAD by duplicating its functions in Dashboard, or you can just use DAD, but we can't figure out why you'd want to use both.

A GRAB BAG OF EXTRAS

WORDPERFECT SUITE ALSO INCLUDES a few tools that have no competitors in the other suites. CorelFlow is a program that lets you create flowcharts and other business diagrams. With Envoy, an electronic publishing application similar to Adobe's Acrobat, you can create document files that can be shared with other users who don't have the originating program. Also included is IBM's VoiceType Control software, which lets you execute commands in some applications by talking into a microphone attached to your sound card. It's an interesting option, but when we used it with several mass-market microphones, it did only a so-so job of understanding our instructions. —*Peter Scisco* ■

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Circle 7 on reader service card

YOUR PARENTS WERE RIGHT. Watching too much TV *is* bad for your eyes. The same thing holds true for monitors. If you work late, surf the Internet, or play games, by the end of the week, that really adds up. Is the monitor you're using up to par?

We've rounded up 25 17-inch monitors that claim to offer sharper displays, meet stricter emission standards, and use more accurate controls than earlier models. All these monitors are Plug and Play compatible, sport more image controls than before, and can refresh at higher rates so you see less flicker. A low-end 17-inch model still costs over $600, but this year that same money buys many features found in last year's high-end models. The most expensive unit here is $1159, compared to over $1400 last year. ▶

BY JOHN GODDARD AND OWEN LINDERHOLM

More for the Money

17-INCH MONITORS

Four reasons to **upgrade** to a **big** monitor: more screen area, more detail, less flicker, less hassle. We rate **25** leading **17-inch** models to find the best deals for work and play.

PHOTOGRAPHY BY ROBERT OLDING

Unlike with a TV, monitor measurements are not for the screen size you see. The "17 inches" refers to measurement across the diagonal of the full tube, including what's covered by the bezel. Most 17-inch monitors average 15.8 inches across the screen's diagonal. The smallest screens we measured—15.4 inches on Mitsubishi's Diamond Scan 17HX and Techmedia's TCM-1700G—were over 9 square inches smaller than the largest screens (15.9 inches) from Continental, Gateway 2000, IBM, LG Electronics, Philips, ViewSonic, and Wyse.

If you're still not sure about upgrading to a bigger screen, think about what you'd use it for. If you use your computer occasionally to type a letter or play games, a 17-inch monitor may be a waste of money. But if you're constantly scrolling the screen to see everything in a window, or shuffling through layers of applications and documents, a 17-inch monitor is worth the extra cost—about $200 more than a cramped 15-inch unit. Smaller monitors may peak at 800 by 600 resolution, but 17-inch models can comfortably handle 1024 by 768 or higher. You can see almost two-thirds more, which translates to at least five more spreadsheet rows and columns, or up to eight more lines of text.

FULL-JURY TESTS

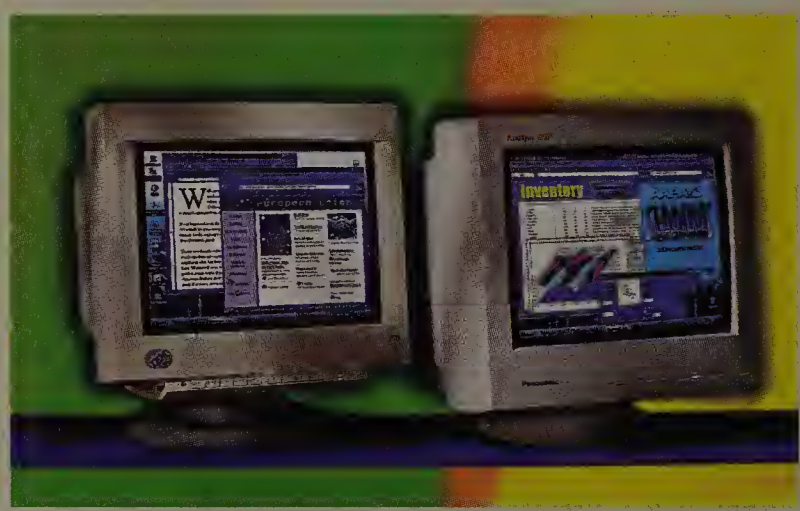
WE SUBJECTED each unit in this review to a new suite of jury and instrumentation tests. After consulting with dozens of monitor engineers at a recent *PC World* monitor summit, we've improved the way we test in order to give you a better idea of how a display will perform on your desk.

For starters, we've doubled the number of judges by including five ordinary users to make sure we're looking at screens as a typical user would under average, yet controlled, fluorescent office lights. We've also doubled the number of typical work documents we study to gauge text and graphics quality. For text, we checked if letters and numbers were as legible in the center as they are on the edges of the screen. For graphics, we scrutinized four color images: a pack of Olympic runners, a shot of glazed fruit, a park scene, and a Web page. Beyond overall picture sharpness, we looked for realistic skin tones, accurate colors, and subtle details in highlight and shadow areas.

All the monitors were tested at 1024 by 768 resolution with a 75-Hz refresh rate. To ensure objectivity, we covered the bezels to hide brand names, and we tested the products on nonmetallic racks to avoid electromagnetic interference. We also ran instrumentation tests to confirm the manufacturer's claims and to make sure a unit wasn't defective. However, these special tests are not part of our image scores, which are based solely on visible qualities seen by our jury.

BEST BUYS

OF THE 25 MONITORS we tested, 2 stand out with terrific image quality, features, and support policies: the IBM P70 (left) and the Panasonic PanaSync S17 (right). Letters and images look sharp on IBM's $899 P70. Its .26mm Trinitron tube, easy-to-decipher on-screen menu scheme, and big 15.9-inch screen make for comfortable viewing. If you're on a tighter budget, your second Best Buy bet is the $699 Panasonic PanaSync S17.



What we found wasn't surprising. No monitor is perfect. For razor-sharp text and brilliant graphics, IBM's P70 looked the best. Sony's Multiscan 17seII and Continental's Digiview 1709D were next best for sharp text, while Packard Bell's 3020 SL and Panasonic's PanaSync S17 rivaled the IBM for truest graphics. We were least impressed by the fuzzy letters and dull images on the MAG DX17T, the Techmedia TCM-1700G, and the CTX VL700.

EYESTRAIN, EMISSIONS, AND FLICKER, OH MY

A BIG CONCERN is eyestrain caused by slow screen refresh. Most people notice flicker if the refresh rate is below 70 Hz (redrawing the screen 70 times per second). All the monitors here refresh at 75 Hz or greater; rates above 85 Hz are necessary only for high-end CAD. And despite the hype about Plug and Play monitors, you can't use Win 95 to change refresh rates: You need the latest drivers from your graphics card maker. All monitors reviewed here comply with the MPR-II standard, which limits potentially harmful screen emissions to under 20 inches. Ten of the units meet TCO's stricter 12-inch shielding limit.

LOOK BEFORE YOU BUY

SEE THE TOP 10 Monitors chart on page 237 for a summary of this month's rankings. To keep you informed, every four months we'll compare newer 17-inch models against the ones reviewed here and update the results. Because of our new test suite, prior monitor rankings cannot be compared to this new format. To read an expanded version of this article, visit PC World Online at http://www.pcworld.com/t10monitors.

Shopping for a new monitor isn't easy. All the latest features can make a product look great on paper, but seeing it with your own eyes is the best way to judge if it's right for you. If you buy direct, get the salesperson to let you set up the monitor before you purchase it. Most of these units use on-screen menus, which sounds like a great idea but in reality may complicate a simple task such as changing contrast or brightness. If you buy a monitor through the mail, check the box for signs of mishandling before unpacking it. Monitors aren't as rugged as they look. Also, pay close attention to the warranty—it's a measure of a company's confidence in its product.

Owen Linderholm is a freelance writer and editor. John Goddard is a staff editor for PC World. *Testing by Susan Silvius and Jeff Kuta of the PC World Test Center.*

For more information about all products in this article, circle reader service no. 910.

1 IBM P70

PROS: Best text and graphics, large 15.9-inch viewable screen size

CONS: Two faint lines across screen

IT'S RARE for a monitor to excel at displaying both text and graphics. IBM's $899 P70 is an exception. This Best Buy monitor provides terrific picture quality. The .26mm stripe pitch Trinitron tube trounced the competition with superb text and graphics detail, but the P70's 15.9-inch diagonal screen makes it one of the largest displays in this review. And at 1024 by 768 resolution, the P70 comfortably refreshes at 85 Hz, effectively eliminating any perception of flicker.

Flipping open the control panel cover reveals a row of nine buttons along the bottom of the screen bezel. The buttons are clearly labeled and easy to use. Adjusting basic settings such as contrast and brightness takes no more than two button clicks—just press a button, and an adjustment gauge appears. A truckload of advanced controls, such as trapezoid and image tilt, are logically organized in the menus. The P70 also meets the strict TCO spec for low emissions. And the full three-year warranty, with free on-site service and 24-hour toll-free technical support, is great. Plain and simple, the IBM P70 has the best screen quality of all the 17-inch monitors in this review. IBM, 800/426-7255, http://www.pc.ibm.com

2 Panasonic PanaSync S17

PROS: Very good text and graphics, affordable

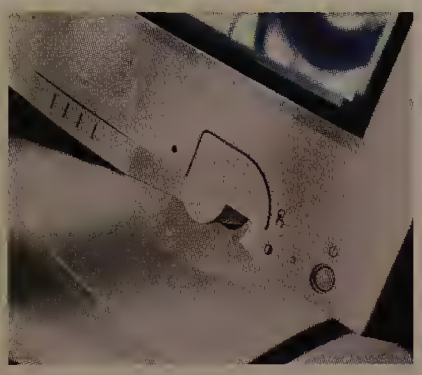
CONS: On-screen menu icons difficult to decipher

FOR $200 LESS than the IBM, we expected the $699 Panasonic PanaSync S17 to have a lower display quality. But the text samples we saw on Web pages and Windows documents were very sharp. Colors also looked bright and accurate—particularly the flesh tones. This light-gray monitor uses a .27mm dot pitch tube capable of an 85-Hz refresh rate at 1024 by 768 resolution.

The Panasonic's button controls are simple enough: four push buttons—one to activate the menu, two to scroll up and down the menu list, and one to make a selection. But the on-screen menus are displayed as a set of almost hieroglyphic icons. Some, like brightness, are obvious, but we would not have guessed that a diamond with an arrow pointing left means reset the picture to default settings. That gripe aside, this is a terrific monitor. Its full three-year warranty, around-the-clock toll-free support, low price, and attractive display quality earn the PanaSync S17 a Best Buy. Panasonic, 800/742-8086, http://www.panasonic.com

READER SERVICE NO. 790

A SHARP PICTURE put both of these monitors on the Top 10. For crunching numbers or viewing graphics, the Continental Digiview 1709D (left) and Packard Bell 3020 SL (right) deliver.



THE ONE-BUTTON CONTROL on the Continental Digiview 1709D looks odd, but it works well with the on-screen menus. Wyse's WY-17PS also sports this control.

3 Continental Digiview 1709D

PROS: Excellent for reading text, very good graphics, easy to adjust

CONS: Power switch located on back of monitor, two faint lines across screen

THE CONTINENTAL DIGIVIEW 1709D does an impressive job with both text and images. Whether you're typing business letters or designing graphics, the picture is almost as crisp and accurate as what you get with the IBM P70.

The Continental Digiview has basically the same tube, design, and controls as the Wyse Technologies WY-17PS. But at $799, it's $120 less than the Wyse model. Overall, the Continental is the better deal.

The Continental shares with the Wyse an unusual control system. It has a flat, mushroom-shaped master control button with two smaller buttons on the right side of the case, plus a dial under the bezel. To use the on-screen menus, you have to click the master control button, then spin the dial to cycle through each menu. Clicking the master button again selects the menu item. Another turn of the dial makes the adjustment. It takes a little practice, especially if you're left-handed. Fortunately, adjusting contrast and brightness requires just two clicks.

Like all other monitors reviewed here, the 1709D is energy efficient, but what looks like a power button on the front just puts the unit into sleep mode (it still draws power). The real on/off button is on the back. Aside from that, the Digiview's large 15.9-inch viewable screen, sharp .25mm stripe pitch Diamondtron tube, and ample controls make it a good choice. Continental Technologies, 818/854-8288, http://www.digiview.com

READER SERVICE NO. 791

4 Packard Bell 3020 SL

PROS: Low price, great-looking text and graphics

CONS: One-year warranty, no image tilt or reset controls, requires repeated button pushing to maneuver through the on-screen menus

THIS LIGHT-GRAY AND STYLISHLY CURVED monitor was a surprise in many ways, since Packard Bell is better known for its aggressive pricing and less-than-superior quality. At just $660, the 3020 SL is one of the least expensive monitors in this review, but we didn't expect the text and graphics to approach that of the number one Best Buy IBM P70. Fine type looked sharp even in the corners, and it was easy to see picture details in the shadows and bright spots where other monitors had trouble. What's more, we noticed that the screen was uniformly bright.

So what's the problem? Despite its good looks, this Packard Bell lacks some important features and controls—such as tilt and reset—found in nearly all monitors. Maneuvering ▶

17-INCH MONITORS — STANDARD FEATURES

	MONITORS	Street price (5/31/96)	Tube manufacturer	Max. refresh rate at 800 x 600 (Hz)	Max. refresh rate at 1024 x 768 (Hz)	Viewable screen diagonal (inches)	Dot or stripe pitch (mm)	Width x depth x height (inches)	Maximum horizontal scan rate (kHz)
1	IBM P70*	$899	Sony	85	85	15.9	stripe .26	15.9 x 17.7 x 16.8	85
2	Panasonic PanaSync S17*	$699	Matsushita	108	85	15.7	dot .27	16.1 x 17.5 x 16.4	69
3	Continental Digiview 1709D	$799	Mitsubishi	120	101	15.9	stripe .25	16.1 x 17.2 x 17.1	82
4	Packard Bell 3020 SL	$660	Hitachi	75	75	15.7	dot .28	16.7 x 17.8 x 16.4	69
5	Samsung SyncMaster 17GLsi	$910	Samsung	120	105	15.8	dot .26	16 x 17 x 17.1	85
6	Wyse Technologies WY-17PS	$919	Mitsubishi	120	101	15.9	stripe .25	16.1 x 17.2 x 17.1	82
7	ViewSonic PT770	$899	Mitsubishi	120	101	15.9	stripe .25	16.1 x 17.2 x 17.1	82
8	Dell UltraScan D1726T-HS	$799	Sony	135	105	15.7	stripe .25	15.9 x 17.7 x 16.8	85
9	Mitsubishi Diamond Scan 17HX	$849	Mitsubishi	130	105	15.4	dot .26	16.1 x 16.7 x 16	82
10	Sony Multiscan 17sell	$1159	Sony	120	100	15.7	stripe .25	15.9 x 17.7 x 16.8	85

* Best Buy [1] Three-year warranty if purchased with Packard Bell PC. See Top 10 chart, page 237.

through the on-screen menus with the four control buttons was cumbersome. And if you don't buy the monitor with a Packard Bell PC, your warranty drops from three years to only one. The 3020 SL is not the best choice if you're upgrading your monitor, but it's comforting to know that you'll get a good monitor if you buy a PC from this company. Packard Bell, 800/733-5858, http://www.packardbell.com

READER SERVICE NO. 792

5 Samsung SyncMaster 17GLsi

PROS: Very good text, extensive on-screen menus, easy to adjust

CONS: Ordinary graphics quality

NUMBER CRUNCHERS AND DESKTOP PUBLISHERS will appreciate the very crisp text detail on the Samsung SyncMaster 17GLsi, but if you're a power graphics user, the Samsung is not the best choice. Our judges felt it had only average graphics quality because subtle details in highlights and shadow areas were a tad less visible than on other monitors. This unit boasts a .26mm dot pitch and can refresh as high as 105 Hz at 1024 by 768 resolution. At 15.8 inches, the viewable screen size is fairly large.

A bevy of high-end screen controls earned the Samsung the highest marks for features and ease of use. Below the screen is a drop-down control panel with eight white and four blue buttons. Touch the white button for brightness, and the exact adjustment level appears on screen. There's no need to hunt through menus. The four blue buttons let you maneuver through on-screen menus where more advanced controls for nearly every image aspect are stored, including a rare control that lets you keep an old screen in focus. Despite disappointing graphics quality, the SyncMaster is aimed at high-end CAD/CAM and desktop publishing types who can deal with an equally high $910 price. Samsung, 800/933-4110, http://www.samsung.com

READER SERVICE NO. 793

BUTTONS ALLOW RAPID ACCESS to sophisticated controls on the Samsung SyncMaster, but be careful not to hit the wrong button.

6 Wyse Technologies WY-17PS

PROS: Very good graphics, large 15.9-inch viewable screen, easy to adjust

CONS: Power switch is on back of monitor, two faint lines across screen

NO TWO MONITORS ARE ALIKE, RIGHT? Right. At $919, this .25mm stripe pitch Diamondtron monitor from Wyse seems identical to the number three Continental Digiview. Overall image quality was impressive on both, but text was sharper on the Continental. Graphics quality was about even. So what's going on? To borrow a phrase from the automobile industry, mileage may vary, even among monitors. Both vendors use the same parts, but engineering tweaks and different components around the tube produce varied results. Both have identical specs, use the same odd master control button to move through on-screen menus, and have a power-down switch on front; to turn off the monitors, you need to reach around back. But the Wyse is lower on the chart because it costs $120 more than the Continental. Wyse Technologies, 800/438-9973, http://www.wyse.com

READER SERVICE NO. 794

7 ViewSonic PT770

PROS: Very good text, high refresh rate, easy to adjust

CONS: Two very faint lines visible across screen

WHETHER YOU'RE reading a long report or studying the small type in the footnotes, the $899 ViewSonic PT770 is very good at displaying text crisply, and scanned photos were rendered with good detail and realistic color quality in our tests. However, other monitors higher up the chart displayed graphics better.

The PT770 has a .25mm stripe pitch Diamondtron tube and a high refresh rate of 101 Hz at 1024 by 768. It offers a full range of adjustment options in the on-screen menus. However, our judges felt that the four-button controls on the bezel were awkward.

The ViewSonic PT770 is a nice monitor, but

CONTROLS								COMPLIANCE				SUPPORT		
On-screen controls	Reset to factory settings	Screen position and size	Pin-cushion/ barrel	Trapezoid/ keystone	Focus/ convergence	Image tilt/manual degauss	Color temperature/ RGB control	Plug and Play	MPR-II low emission	TCO shielding	Nutek power saving	Warranty (years)	Technical support (hours)/toll-free	Weekend support
●	●	●	●/●	●/●	○/●	●/○	●/●	2b	●	●	●	3	24/●	●
●	●	●	●/●	●/●	○/○	●/●	●/●	2b	●	○	○	3	24/●	●
●	●	●	●/●	●/●	○/●	●/●	○/●	2b	●	○	●	3	8/●	○
●	○	●	●/○	●/●	○/○	○/●	●/○	2b	●	●	○	1[1]	24/●	●
●	●	●	●/●	●/●	●/○	●/●	●/●	2b	●	●	○	3	24/●	●
●	●	●	●/●	●/●	○/●	●/●	○/●	2b	●	○	●	3	9/●	○
●	●	●	●/●	●/●	○/●	●/●	○/●	2b	●	○	●	3	11/●	○
●	●	●	●/●	●/●	●/○	●/○	●/●	2b	●	●	●	3	24/●	●
●	●	●	●/●	●/●	○/○	●/●	●/●	2b	●	○	●	3	8.5/●	○
●	●	●	●/○	○/○	○/●	●/○	●/●	2b	●	●	●	3	15/●	○

● Yes ○ No

for the same price you can get the number one Best Buy IBM P70. ViewSonic, 800/888-8583, 909/869-7976, http://www.viewsonic.com

READER SERVICE NO. 795

8 Dell UltraScan D1726T-HS

PROS: Good text and graphics detail, simple to adjust, high refresh rate

CONS: Two faint lines across the screen, no manual degauss

THE NEW DELL ULTRASCAN has the same trait common to all Trinitron-based monitors—it does a better-than-average job with both text and graphics. In our tests, numbers and spreadsheet cells were sharp, and scanned images looked bright and accurately colored.

This $799 monitor is one of the few on the Top 10 chart that doesn't force you to hunt through on-screen menus to find specific controls. Adjusting the UltraScan's picture is simple. At first the drop-down control panel looks like a befuddling array of buttons, but each one is clearly labeled and easy to use. Simply touch a button, and the corresponding adjustment bar appears. You can change levels using the two adjust buttons. Dell even includes a moiré control—a feature Sony doesn't usually include on its Trinitron tubes—so you can remove swirly interference patterns from busy images that have lots of intersecting lines, such as illustrations or CAD/CAM drawings.

ELEGANT CONTROLS (clockwise from upper left): Samsung SyncMaster 17GLsi, Wyse WY-17PS, ViewSonic PT770, and Dell UltraScan D1726T-HS.

The UltraScan also meets the tough TCO emissions standard, and refresh can be set as high as 105 Hz at 1024 by 768 resolution. Dell backs up the monitor with a full three-year warranty and 24-hour toll-free tech support. All that adds up to a good deal for the price. Dell Computer, 800/289-3355, http://www.dell.com

READER SERVICE NO. 796

9 Mitsubishi Diamond Scan 17HX

PROS: Extensive and easy-to-adjust on-screen controls, high refresh rate

CONS: Mediocre text focus, small 15.4-inch screen, two lines across screen

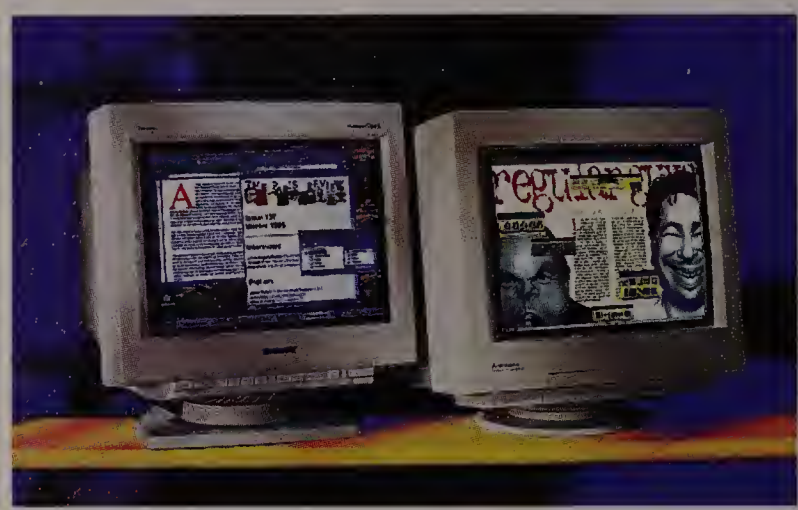
THIS $849 MITSUBISHI Diamond Scan packs lots of high-end controls, but our judges pointed out areas of slightly unfocused text and hazy graphics. As a result, this .26mm dot pitch unit takes ninth place on the Top 10 Monitors chart.

To the 17HX's credit, we liked how easy it was to adjust. Press the center of the bezel below the screen, and a wide control panel drops down. Inside are four buttons that work well in tandem with the on-screen menus. Changing contrast and brightness takes no more than two button clicks each, and more advanced controls—including trapezoid and keystone—are easy to find in the menus.

Mitsubishi also includes software for correcting ▶

color quality and adjusting image geometry so the display stays accurate. Despite all these extras, we expected a bigger and better picture for the high price. Mitsubishi Electronics, 800/843-2515, 714/236-6352, http://www.mela-itg.com

READER SERVICE NO. 797



THE SONY MULTISCAN 17seII (left) and Mitsubishi Diamond Scan 17HX (right) have top-dollar prices that land them low on the chart.

10 Sony Multiscan 17seII

PROS: Terrific text quality, above-average graphics detail, low emissions

CONS: Very expensive, two faint lines visible across the screen

IF MONEY WERE NO OBJECT, and image quality and features were all that mattered in a monitor, then the Sony Multiscan 17seII would score higher. But at $1159, this is the most expensive monitor of the bunch. If you read a lot on screen or labor over spreadsheets, you'll find that the text quality on this Sony rivals that of our Best Buy from IBM. In our tests, Web page graphics looked vivid and color photo details were accurately rendered, though not as well as on the IBM.

Control button overload? The ten buttons below the screen look somewhat crowded, but they're clearly labeled and work well with the on-screen menus. Pushing a button activates an on-screen bar graph that shows the exact adjustment level, so there's no need to hunt through menus. On the other hand, the 17seII lacks a manual degauss button and common advanced controls for fixing trapezoid or keystone distortion. Nonetheless, if you need a monitor that can display high-definition graphics, the 17seII's 15.7-inch viewable screen can refresh as fast as 100 Hz at 1024 by 768 resolution. If you must have Sony, the Multiscan 17seII is worth a look, but for $260 less, the IBM P70 is a better deal. Sony, 800/352-7669, http://www.sel.sony.com

READER SERVICE NO. 798

Snapshots

These monitors were also tested this month but didn't score high enough to make the Top 10.

AcerView 78ie

DECISIONS, DECISIONS. If you opt for the 78ie with an Acer system, you're covered for three years, but if you buy it separately for $829, coverage is only one year. How does it perform? Spreadsheets were crisper than average, but graphics were hazy on several of our test screens. Also, the 15.6-inch diagonal screen size is small. Acer includes a minimal four-button control panel for navigating through on-screen menus, but the button clicking is cumbersome. To its credit, the 78ie meets the strict TCO emissions standard and can refresh at 85 Hz at 1024 by 768 resolution. Acer America Corp., 800/733-2237

READER SERVICE NO. 799

ArtMedia TX-1864

FOR $788, WE EXPECTED a better picture from the ArtMedia TX-1864. It has a .25mm stripe pitch Trinitron tube, a 75-Hz refresh rate at 1024 by 768, and a 15.7-inch viewable screen size. Text looked okay, but graphics were dull. The on-screen menus work well in tandem with the control buttons below the screen, but we couldn't get as full a range of contrast and brightness levels as we could with other monitors. ArtMedia, 800/278-6334

READER SERVICE NO. 800

CTX VL700

IF IMAGE IS EVERYTHING, then the CTX VL700 is in trouble. Fuzzy text and lackluster graphics earned it poor ratings from our judges. The VL700 uses a .28mm dot pitch tube and has a standard refresh rate of 75 Hz at 1024 by 768 resolution. The on-screen menus were awkward at times, but adjusting contrast and brightness required no more than two button clicks each. At $659, the CTX VL700 ties the MAG InnoVision DX1795 for the lowest price here, but you certainly get what you pay for. CTX International, 800/289-8808

READER SERVICE NO. 801

Gateway 2000 Vivitron 1776

HOW DOES Gateway's standard 17-incher (15.9-inch viewable) measure up? Refresh rates are within spec—76 Hz at 1024 by 768 resolution—and colors were bright on the .26mm Trinitron screen, but text and graphics detail weren't quite Top 10 quality. The monitor also lacks on-screen controls, but ten buttons make it easy to fine-tune the picture. For $699 you get a fine monitor, but for the same price our Best Buy from Panasonic is a better deal. Gateway 2000, 800/846-4208

READER SERVICE NO. 802

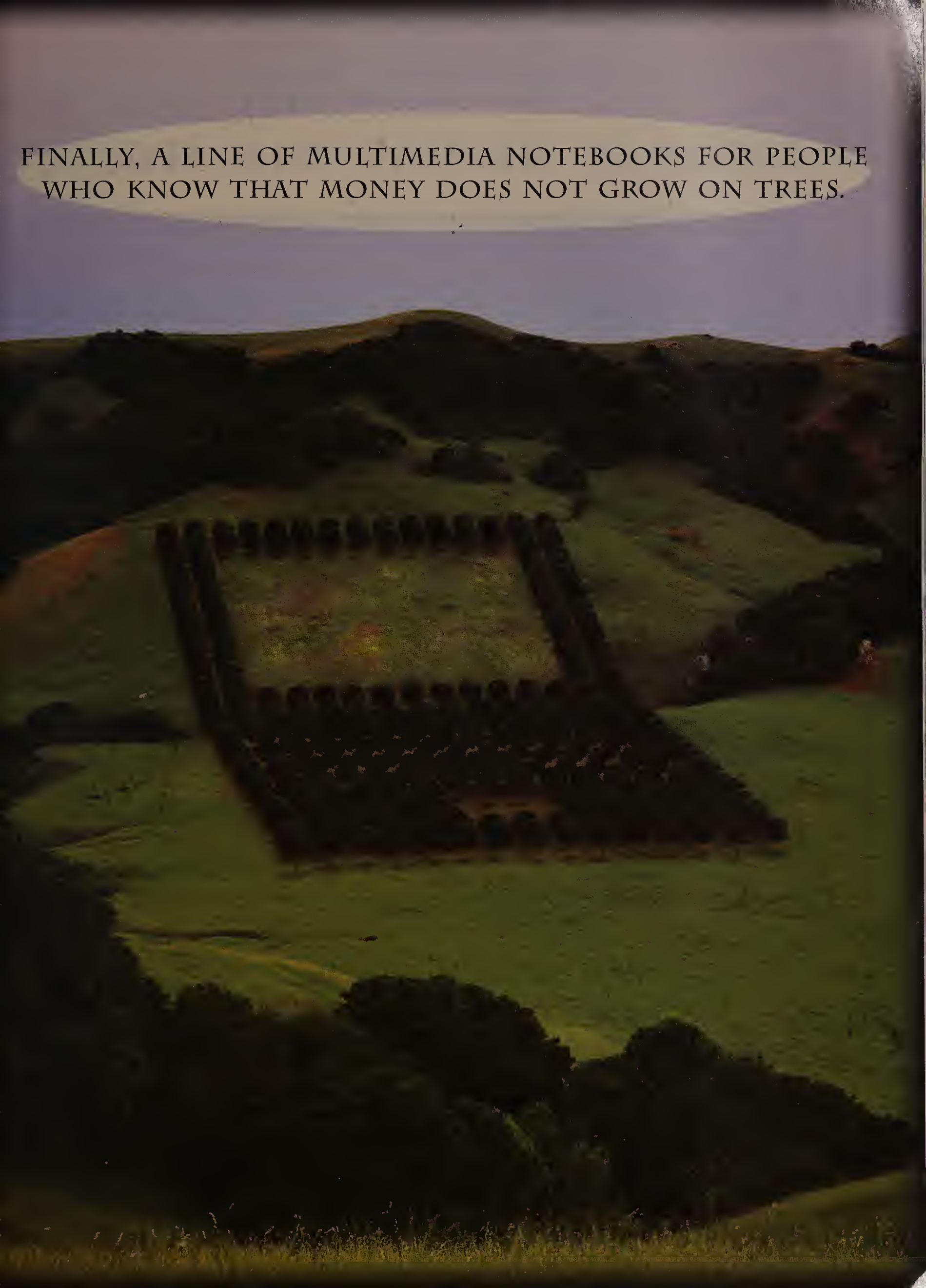
GoldStar StudioWorks 78m

WINDOWS EVENTS, games, and presentations sound good on the multimedia GoldStar StudioWorks 78m. This $799 unit sports speakers, a mike, a headphone jack, and a volume control on the front bezel. The on-screen menus look a bit cryptic, but they were easy to maneuver in our tests—at least until the main control panel button snapped off. Text detail was adequate, but graphics looked dull compared to the other screens we saw. LG Electronics, 800/243-0000

READER SERVICE NO. 803

MAG InnoVision DX1795

FOR A MERE $659, the MAG InnoVision DX1795 has a big 15.8-inch viewable screen and a handsome look. But the monitor's picture quality earned only adequate marks from our judges. Text could have been sharper, and colors were a tad dull. To adjust the screen, you simply tap one of nine buttons on the bezel to activate the on-screen menus. Contrast and brightness controls are only a click away, but you must navigate through the cryptic menus to find more advanced con- ▶


FINALLY, A LINE OF MULTIMEDIA NOTEBOOKS FOR PEOPLE
WHO KNOW THAT MONEY DOES NOT GROW ON TREES.

INTRODUCING THE
A LINE OF AFFORDABLE, MULTIME

Echos P100C

Pentium 100MHz processor
PCI Bus, 256K L2 cache
8MB std./40MB max. RAM; 1.3GB removable HDD
11.3" DSTN display; 800x600 SVGA resolution
Multi-function bay: 6X CD-ROM (std.),
modular FDD (std.), second battery (opt.)
Est. Street Price:

$2,499*

Echos P100E

Pentium 100MHz processor
PCI Bus, 256K L2 cache
8MB std./40MB max. RAM; 1.3GB removable HDD
10.4" TFT display; 800x600 SVGA resolution
Multi-function bay: 6X CD-ROM (std.),
modular FDD (std.), second battery (opt.)
Est. Street Price:

$3,199*

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innovation has grown our company into one of Europe's top PC manufacturers. Now we're introducing int
the U.S. the award-winning line of powerful and truly affordable multimedia notebooks. The Echos
series, from Olivetti.® From the entry level notebook to our 133MHz model, the Echos line delive

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CHOS SERIES:
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Echos P120E

Pentium 120MHz processor
PCI Bus, 256K L2 cache
8MB std./40MB max. RAM; 1.3GB removable HDD
11.3" TFT display; 800x600 SVGA resolution
Multi-function bay: 6X CD-ROM (std.),
modular FDD (std.), second battery (opt.)
Est. Street Price:

$3,799*

Echos P133S

Pentium 133MHz processor
PCI Bus, 256K L2 cache
16MB std./40MB max. RAM; 1.3GB removable HDD
11.8" TFT display; 800x600 SVGA resolution
Multi-function bay: 6X CD-ROM (std.),
modular FDD (std.), second battery (opt.)
Est. Street Price:

$4,799*

tium® Processor-based multimedia power and sleek, lightweight design at every step. And as more and more
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Circle 162 on reader service card

trols such as image tilt and trapezoid distortion. MAG InnoVision, 800/827-3998

READER SERVICE NO. 805

MAG InnoVision DX17T

NOT ALL TRINITRON TUBES are created equal. Graphics looked okay on this $735 MAG unit, but text was fuzzy on our Web page screen. There are no on-screen menus, but below the screen are 12 unsightly control buttons hidden behind a cover. Adjusting picture size, tilt, and pincushion is straightforward. The three-year parts warranty covers the tube for only two years and labor for one. MAG InnoVision, 800/827-3998

READER SERVICE NO. 804

NEC MultiSync M700

NUMBERS AND LETTERS looked very sharp on the $899 NEC MultiSync M700, but the foggy graphics were a surprise. The problem: poor glare coating under fluorescent office lights. NEC makes up for this with fancy features. The unit's sleek bezel sports speakers and a mike that sound fine with Windows events but not music. Animated icons and plain-English menus make it easy to figure out advanced controls; for example, the pincushion icon—labeled In/Out—bows back and forth on each side. But the design isn't perfect: It takes four button clicks to adjust contrast, and five just to change brightness. NEC, 800/632-4636

READER SERVICE NO. 806

Nokia 447Xav

EXTENSIVE AND EXPENSIVE. That's the $949 Nokia 447Xav multimedia monitor in a nutshell. For starters, the speakers and subwoofer sound great, even with music CDs. The built-in mike is sensitive, and for an extra $499 Nokia includes a video camera between the speakers. The on-screen menu controls are intuitive, and this is the only monitor in the review that works with Access.bus-enabled PCs. The .25mm stripe pitch Trinitron tube delivers a 100-Hz refresh rate at 1024 by 768 resolution, and 85 Hz at 1280 by 1024. But the combination of average text focus, ordinary color graphics detail, and a steep price balances out the product's many cool features. Nokia, 800/269-6542

READER SERVICE NO. 807

Panasonic PanaSync Pro C-1792P

TYPE LOOKED CRISPER THAN AVERAGE on page layouts, but lackluster graphics quality and a steep $859 price kept this .25mm dot pitch monitor off the Top 10 chart. Colors were bright, but skin tones on our image of runners didn't compare to those from higher-ranked monitors. We liked the full palette of on-screen menu controls—such as moiré and image tilt—but none could improve the picture. To its credit, the PanaSync Pro C-1792P offers ample features and a full three-year warranty. Panasonic, 800/742-8086

READER SERVICE NO. 808

Philips Brilliance 1730DC

HO-HUM TEXT AND GRAPHICS are what you get with this monitor. For $949, we expected better shadow and highlight detail in graphics, and sharper letters. The speakers inside are okay for Windows events but not for music or games. Then again, adjusting contrast, brightness, or image size takes less than three clicks, thanks to a logical on-screen menu scheme. And the 1730DC's big 15.9-inch viewable screen and strict TCO shielding compliance are pluses. Philips Consumer Electronics Co., 800/531-0039

READER SERVICE NO. 809

Portrait Display Labs Pivot 1700

THIS $1049 MONITOR is built to tilt. To view full Web pages or layouts, simply grab a corner and rotate the screen from landscape to portrait mode. However, each time you pivot the picture, you must press one button to display in the correct orientation and another to degauss the monitor. There are no on-screen controls on the Pivot 1700, but the row of extensive button controls below the screen is clearly labeled. Though the unit refreshes at a standard 75 Hz at 1024 by 768 resolution, in portrait mode we noticed that grids of spreadsheet cells were uneven across the screen. In either position, pictures looked good, but text wasn't crisp. Portrait Display Labs, 800/858-7744

READER SERVICE NO. 810

FULL-PAGE TILT: Portrait Display Labs' Pivot 1700 can show you entire pages—just tilt it from landscape to portrait mode.

Sampo AlphaScan 760

BUSINESS LETTERS look very crisp on Sampo's AlphaScan 760. The .25mm stripe pitch Diamondtron tube displayed type that's as sharp along the edges of the screen as it is in the middle. Graphics looked good, but colors were not as vivid as with monitors on the Top 10 chart. The array of controls arching below the 15.8-inch screen is elegantly designed, but it takes a few button clicks to activate and hunt down items in the on-screen menus. That, and a mere two-year warranty, is why this $849 monitor barely missed a Top 10 ranking. Sampo, 770/449-6220

READER SERVICE NO. 811

Techmedia TCM-1700G

THE PRICE LOOKS GOOD on the $688 Techmedia TCM-1700G, but the picture doesn't. Fuzzy text and drab graphics kept this low-end monitor out of the running. The on-screen menus were a little awkward to decipher, and there's no image reset button in case you mess up while adjusting the screen. Spend just $11 more to nab the Best Buy from Panasonic. Techmedia, 800/379-0077

READER SERVICE NO. 812

Wyse Technologies WY-17E

ASIDE FROM ITS LOW $711 PRICE, this monitor has little to distinguish itself. Graphics looked acceptable, but the fuzzy text was annoying on the .28mm dot pitch screen. The on-screen menus weren't difficult to master, but repeated button pushing to cycle to each item was tedious. For $12 less, opt for the Best Buy Panasonic. Wyse Technologies, 800/997-0014

READER SERVICE NO. 813 ■

PC MAGAZINE EDITORS' CHOICE

JUNE 25, 1996
MILLENNIA P133

FROM THE CORPORATE SUITE TO THE HOME OFFICE...

PC MAGAZINE EDITORS' CHOICE

JUNE 25, 1996
MILLENNIA P166

MICRON™ ELECTRONICS, INC.

MICRON HAS YOU COVERED

PC MAGAZINE EDITORS' CHOICE
JUNE 25, 1996
MILLENNIA P166

PC MAGAZINE EDITORS' CHOICE
JUNE 25, 1996
MILLENNIA P133

PC MAGAZINE EDITORS' CHOICE
AUGUST 1996
MILLENNIA
TRANSPORT P133

THIS SUMMER, MICRON HAS WON THREE *PC MAGAZINE* EDITORS' CHOICE AWARDS FOR MILLENNIA DESKTOP AND NOTEBOOK COMPUTERS.

NOW YOU GET TWICE THE MEMORY IN SELECTED SYSTEMS! (SEE CONFIGURATIONS)

SUPERIOR SOLUTIONS BY DESIGN

Any PC maker can claim to offer a solution that covers your needs. But at Micron™ Electronics, we prefer to let our history and our products speak for themselves. We think you'll agree it's an impressive story.

Superior Technology—A Micron Tradition

Micron builds PCs with a legacy of excellence. Our manufacturing processes grew out of nearly two decades in the semiconductor business, where precision is measured in millionths of an inch, and quality in parts per million. We've built strategic relationships with companies like Intel, Microsoft® and Novell®. From this solid background, we're forging unbeatable systems you can count on today and tomorrow. Best of all, we just doubled our memory and added powerful enhancements to several of our systems (see configurations). This industry-leading approach gives you a vast increase in system capacity at bargain prices.

Award-Winning Products

In the past two years, leading industry publications have applauded Micron PCs with more than 140 awards for product performance, customer service and support. This includes *PC Magazine*'s Best Products of 1995 and Editors' Choice awards in several categories. Add more than 40 *PC World* Best Buy awards and you've got an impressive technology hall of fame. In fact, just this summer, Micron has won three *PC Magazine* Editors' Choice Awards for Millennia desktop and Millennia TransPort notebook computers—an unprecedented achievement for Micron.

Recognized Service and Reliability

After your purchase, the story continues. Just ask *PC Magazine* readers. They bestowed on us the coveted Readers' Choice for Customer Service and Reliability in 1994 and 1995. And *PC World* recently awarded us first tier status along with the likes of Apple, Compaq, Digital and HP. Pretty good company, wouldn't you say?

RELIABILITY RANKING

1ST TIER: APPLE, COMPAQ, MICRON, DIGITAL, HEWLETT PACKARD

2ND TIER: AST, DELL, IBM, NEC

3RD TIER: ACER, LEADING EDGE, GATEWAY 2000, PACKARD BELL

Source: *PC World* Reliability & Service Monitor, May 20 - November 20, 1995

Micron Power℠ Warranty*—An Industry First

We support our reliability promise with the industry-leading Micron Power warranty. It backs the microprocessor and main memory for five years, an industry first. Add a three-year, parts-only system warranty and a 30-day money-back guarantee, and you can rest assured that you're in good hands.

Micron brings super high-tech manufacturing to the PC factory floor. Recently we've invested millions of dollars to build the most advanced PC manufacturing facility possible.

Outstanding Performance—Don't Take Our Word for It.
Talk is cheap when you're speaking for yourself. But when it's from the mouth of an industry expert, it carries weight. Here are a few of many examples of what they're saying about Micron PCs:

Micron Home MPC *". . . the fastest we've ever tested . . . as well as a marvelous family package . . . it wins our Top Rated award. . . ."* ***—Family PC,*** **May 1996**

Micron Millennia *"In short, Micron covers all the bases with this Best Buy."* ***—PC World,*** **March 1996**

Micron PowerServer *"This is definitely a best buy."* ***—Computer Shopper,*** **January 1996**

Micron Millennia TransPort *". . . nearly a dead ringer for IBM's ThinkPad . . . but performs better and saves you about $2,500."* ***—PC Magazine,*** **April 1996**

The Right System for You
Micron makes a suite of outstanding solutions designed for the way you work or play. From home systems to servers, desktop PCs to portable multimedia solutions, Micron always comes through with a system built to satisfy. For details and prices, turn the page.

"Micron Power" Warranty & Support

- 5-year limited warranty on microprocessor and main memory
- 3-year limited parts-only system warranty
- 1-, 2- or 3-year optional on-site service agreement for all desktop systems
- 30 days of free Micron-supplied software support
- 30-day money-back policy
- 24-hour technical support

All sales are subject to Micron's standard limited warranties and terms and conditions of sale. Copies of our limited warranties may be obtained on our web site or by calling Micron.

intel inside pentium PROCESSOR

MICRON™ ELECTRONICS, INC.

800-249-1176

http://www.mei.micron.com

With our legacy of memory and manufacturing expertise, Micron has just doubled memory in several systems (see configurations). We've added other powerful enhancements to give you a vast increase in system capacity.

Millennia™ P166

- Intel 166MHz Pentium® processor
- 512KB pipeline burst cache, flash BIOS
- 8X EIDE CD-ROM drive, 3.5" floppy drive
- 16-bit stereo sound & speakers
- **PCI 64-bit 3D video, MPEG, 4MB EDO**
- Tool-free minitower or desktop
- Microsoft® Mouse, 104-key keyboard
- Microsoft Windows® 95 & MS® Plus! CD
- 5-year/3-year Micron Power℠ warranty*

- **16MB EDO RAM** • 1.2GB EIDE hard drive
- 15" Micron 15FGx, .28dp (13.7" display)
- Microsoft Works 95 CD

$1,999 Business lease $68/month

- **32MB EDO RAM** • 2.1GB EIDE hard drive
- 15" Micron 15FGx, .28dp (13.7" display)
- Microsoft Office Pro 95 & Bookshelf® 95 CDs

$2,399 Business lease $82/month

- **64MB EDO RAM** • 3.1GB EIDE hard drive
- 17" Micron 17FGx, .26dp (15.8" display)
- Microsoft Office Pro 95 & Bookshelf 95 CDs

$3,149 Business lease $107/month

- With 133MHz Pentium processor.....subtract $200
- With 200MHz Pentium processor.....add $100

Millennia P200 Plus

- Intel 200MHz Pentium processor
- 512KB pipeline burst cache, flash BIOS
- PCI 32-bit Ultra SCSI Fast-20 controller
- 8X SCSI CD-ROM drive, 3.5" floppy drive
- 16-bit stereo sound & speakers
- **PCI 64-bit 3D video, MPEG, 4MB EDO**
- Tool-free minitower or desktop
- Microsoft Mouse, 104-key keyboard
- Microsoft Windows 95 & MS Plus! CD
- 5-year/3-year Micron Power warranty*

- 16MB EDO RAM • 1GB Fast SCSI-2 hard drive
- 15" Micron 15FGx, .28dp (13.7" display)
- Microsoft Works 95 CD

$2,499 Business lease $85/month

- 32MB EDO RAM • 2GB Fast SCSI-2 hard drive
- 15" Micron 15FGx, .28dp (13.7" display)
- Microsoft Office Pro 95 & Bookshelf 95 CDs

$3,199 Business lease $109/month

- 64MB EDO RAM • 4GB Fast SCSI-2 hard drive
- 17" Micron 17FGx, .26dp (15.8" display)
- Microsoft Office Pro 95 & Bookshelf 95 CDs

$4,249 Business lease $145/month

- With 166MHz Pentium processor.....subtract $100

Home MPC™ P133

- Intel 133MHz Pentium processor
- 256KB pipeline burst cache, flash BIOS
- **16MB EDO RAM** • 1.2GB EIDE hard drive
- 8X EIDE CD-ROM drive, 3.5" floppy drive
- 16-bit stereo sound & speakers
- 28.8 fax/modem, speakerphone, voice mail
- Microsoft® Phone telephony software
- Internet ready:
  Internet in a Box from CompuServe®/Spry Internet Explorer
- Prodigy®, America Online® & CompuServe trial memberships
- PCI 64-bit 3D video, MPEG, 2MB EDO
- 15" Micron 15FGx, .28dp (13.7" display)
- Tool-free minitower or desktop
- Microsoft Mouse, 104-key keyboard
- Microsoft Windows® 95 & MS® Plus! CD
- Quicken® Financial Pak includes: Quicken Deluxe 5.0; Quicken Financial Planner™; Quicken Parents' Guide to Money™; Quicken Family Lawyer™
- Microsoft Home Pak includes: Works 4.0 for Windows 95; Publisher Deluxe for Windows 95; Encarta® 96; Encarta 96 World Atlas; Music Central™ 96; Wine Guide; Arcade 1.0; Scenes—Sports Extremes Collection; Cinemania® 96; Julia Child Home Cooking; Best of Windows Entertainment Pack; CD Sampler (including Fury³ game demo)
- 5-year/3-year Micron Power℠ warranty*

$1,999

- With 166MHz Pentium processor.....add $200

Home MPC P200

- Intel 200MHz Pentium processor
- 256KB pipeline burst cache, flash BIOS
- **32MB EDO RAM** • 2.1GB EIDE hard drive
- 8X EIDE CD-ROM drive, 3.5" floppy drive
- 16-bit 3D Wavetable stereo sound card
- Advent AV270 2x25 watt stereo speakers
- 28.8 fax/modem, speakerphone, voice mail
- Microsoft Phone telephony software
- Internet ready:
  Internet in a Box from CompuServe/Spry Internet Explorer
- Prodigy, America Online & CompuServe trial memberships
- PCI 64-bit 3D video, MPEG, 2MB EDO
- 15" Micron 15FGx, .28dp (13.7" display)
- Tool-free minitower or desktop
- Microsoft Mouse, 104-key keyboard
- Microsoft Windows 95 & MS Plus! CD
- Microsoft Office Pro 95 & Bookshelf® 95 CDs
- Quicken Financial Pak includes: Quicken Deluxe 5.0; Quicken Financial Planner; Quicken Parents' Guide to Money; Quicken Family Lawyer
- Microsoft Home Pak includes: Works 4.0 for Windows 95; Publisher Deluxe for Windows 95; Encarta 96; Encarta 96 World Atlas; Music Central 96; Wine Guide; Arcade 1.0; Scenes—Sports Extremes Collection; Cinemania 96; Julia Child Home Cooking; Best of Windows Entertainment Pack; CD Sampler (including Fury³ game demo)
- 5-year/3-year Micron Power warranty*

$2,899

- With 166MHz Pentium processor.....subtract $100

NEW

PC MAGAZINE BEST OF 1995 — January 9, 1996 Millennia Line

PC MAGAZINE EDITORS' CHOICE — June 25, 1996 Millennia P166

PC MAGAZINE EDITORS' CHOICE — June 25, 1996 Millennia P133

PC MAGAZINE EDITORS' CHOICE — August 1996 Millennia TransPort P133

PC MAGAZINE EDITORS' CHOICE — May 30, 1995 Millennia P120

PC MAGAZINE EDITORS' CHOICE — May 16, 1995 Home MPC P90

PC WORLD BEST BUY — January 1996 Millennia P133

Windows Stellar APRIL 1996 — April 1996 Millennia TransPort

PC Computing — July 1996 Millennia P166

Computer Shopper Best Buy — January 1996 PowerServer SMP P133

Computer Life Best Buy Everything 1996 — June 1996 Millennia P166

Family PC Recommended — May 1996 Home MPC P133

MVP PC Computing — December 1995 Millennia P133

Millennia TransPort™ P133

- 133MHz Mobile Intel Pentium® processor
- Intel 430MX PCI chipset
- 256KB L2 pipeline burst cache
- 16MB EDO memory (48MB max.)
- BX modular CD-ROM drive
- PCI graphics accelerator, 1MB EDO memory
- Pick-a-Point™ dual pointing devices integrate both pointing stick and touchpad
- Removable EIDE hard drive (1.2GB max.)
- 3.5" modular floppy drive
- Intelligent modular lithium-ion battery
- 16-bit stereo sound
- Built-in stereo speakers and microphone
- 2 Type II or one Type III PCMCIA slots
- S-Video and NTSC video-outputs
- Headphone, microphone and line-in jacks
- 2 infrared ports, one front, one back
- Parallel, serial, VGA and 2 PS/2 ports
- Dimensions: 11.7" x 9.4" x 2.0", Weight: 6.9 lbs.†
- Samsonite® nylon carrying case
- Microsoft® Windows® 95 and MS® Plus! CD
- Microsoft Office Pro 95 and Bookshelf® 95 CDs
- Kensington™ security lock††
- 5-year/3-year Micron Power℠ limited warranty*

† 6.9 lbs. includes 3.5" floppy and one battery
†† Lock secures both Millennia TransPort and MicronDock

- 16MB EDO memory (48MB max.)
- 12.1" active matrix display, 800 x 600
- 1.2GB removable hard drive

$4,399 Business lease $150/month

- 32MB EDO memory (48MB max.)
- Motorola® Montana 28.8 fax/modem
- 12.1" active matrix color display, 800 x 600
- 1.2GB removable hard drive
- 2nd lithium-ion battery

$5,199 Business lease $163/month

Options

- With 150MHz Pentium processor .....add $200
- With Motorola Montana 28.8 fax/modem.....add $299
- With 3Com® Ethernet 10BT PCMCIA .....add $149
- With Samsonite® leather carrying case .....add $99
- With 2nd modular Lithium-ion battery .....add $199
- With 2nd 1.2GB hard drive.....add $599
- With 2nd 2.0GB hard drive.....add $699
- With 16MB DIMM module upgrade. .....add $349
- With 32MB DIMM module upgrade. .....add $749

PC MAGAZINE EDITORS' CHOICE
August 1996
Millennia TransPort P133

PowerServer SMP P133

- Intel 133MHz Pentium processor
- Dual Pentium SMP ZIF sockets
- 512KB write-back cache, flash BIOS
- Slots: 5 EISA, 2 PCI, 1 EISA/PCI
- PCI 32-bit Ultra SCSI Fast-20 controller
- BX SCSI-2 CD-ROM drive, 3.5" floppy drive
- PCI 64-bit video, MPEG, 2MB EDO
- Full-size tower with 10 drive bays
- Microsoft® Mouse, 104-key keyboard
- Microsoft Windows® 95 & MS® Plus! CD
- 5-year/3-year Micron Power℠ warranty*

- 16MB RAM • 1GB SCSI-2 hard drive
- 15" Micron 15FGx, .28dp (13.7" display)

$2,499 Business lease $84/month

- 32MB RAM • 2GB SCSI-2 hard drive
- 15" Micron 15FGx, .28dp (13.7" display)

$3,099 Business lease $105/month

- With second 133MHz Pentium processor.....add $299
- With Windows NT™ Workstation.....add $99

PowerServer SMP P266

- Dual 133MHz Pentium processors
- 512KB write-back cache, flash BIOS
- Slots: 5 EISA, 2 PCI, 1 EISA/PCI
- PCI 32-bit Ultra SCSI Fast-20 controller
- 8X SCSI-2 CD-ROM drive, 3.5" floppy drive
- PCI 64-bit video, MPEG, 2MB EDO
- Full-size tower with 10 drive bays
- Microsoft Mouse, 104-key keyboard
- Microsoft Windows NT Workstation
- 5-year/3-year Micron Power warranty*

- 32MB RAM • 2GB SCSI-2 hard drive
- 15" Micron 15FGx, .28dp (13.7" display)

$3,499 Business lease $119/month

- 64MB RAM • 4GB SCSI-2 hard drive
- 17" Micron 17FGx, .26dp (15.8" display)

$4,549 Business lease $155/month

intel inside pentium PROCESSOR

Millennia Pro200

- Intel 200MHz Pentium Pro processor
- 256KB internal cache, flash BIOS
- BX EIDE CD-ROM drive, 3.5" floppy drive
- 16-bit stereo sound & speakers
- **PCI 64-bit 3D video, MPEG, 4MB EDO**
- Tool-free minitower or desktop
- Microsoft® Mouse, 104-key keyboard
- Microsoft Windows NT™ Workstation CD or Windows® 95 & MS® Plus! CD
- 5-year/3-year Micron Power warranty*

- 16MB EDO RAM • 1.2GB EIDE hard drive
- 15" Micron 15FGx, .28dp (13.7" display)
- Microsoft Works 95 CD

$2,399 Business lease $82/month

- 32MB EDO RAM • 2.1GB EIDE hard drive
- 17" Micron 17FGx, .26dp (15.8" display)
- Microsoft Office Pro 95 & Bookshelf® 95 CDs

$3,049 Business lease $104/month

Millennia Pro200 Plus

- Intel 200MHz Pentium Pro processor
- 256KB internal cache, flash BIOS
- PCI 32-bit Ultra SCSI Fast-20 controller
- BX SCSI CD-ROM drive, 3.5" floppy drive
- 16-bit stereo sound & speakers
- **PCI 64-bit 3D video, MPEG, 4MB EDO**
- Tool-free mini-tower or desktop
- Microsoft Mouse, 104-key keyboard
- Microsoft Windows NT™ Workstation CD or Windows 95 & MS Plus! CD
- Microsoft Office Pro 95 & Bookshelf 95 CDs
- 5-year/3-year Micron Power warranty*

- 32MB EDO RAM • 2GB Fast SCSI-2 hard drive
- 15" Micron 15FGx, .28dp (13.7" display)

$3,499 Business lease $119/month

- 64MB EDO RAM • 4GB Fast SCSI-2 hard drive
- 17" Micron 17FGx, .26dp (15.8" display)

$4,549 Business lease $155/month

- 128MB EDO RAM • 9GB Fast SCSI-2 hard drive
- 21" Micron 21FGx, .26dp (20.0" display)

$7,649 Business lease $240/month

ClientPro™ P100

- Intel 100MHz Pentium processor
- 256KB pipeline burst cache, flash BIOS
- 3Com 3C509 Combo network adapter
- 3.5" floppy drive
- Tool-free minitower or desktop
- Microsoft® Mouse, 104-key keyboard
- Microsoft DOS 6.22/Windows® for Workgroups 3.11
- 5-year/3-year Micron Power℠ warranty*

- PCI 64-bit graphics accelerator (2MB EDO)
- 8MB EDO RAM • 1.2GB EIDE hard drive
- 14" Micron 14FGx, .28dp (12.9" display)
- Microsoft Works preinstalled

$1,499 Business lease $51/month

- PCI 64-bit graphics accelerator (2MB EDO)
- 16MB EDO RAM • 2.1GB EIDE hard drive
- 15" Micron 15FGx, .28dp (13.7" display)
- Microsoft Office Pro 4.3 preinstalled

$2,018 Business lease $69/month

- With 133MHz Pentium processor.....add $100

ClientPro P200

- Intel 200MHz Pentium processor
- 256KB pipeline burst cache, flash BIOS
- 3Com 3C509 Combo network adapter
- 32MB EDO RAM • 3.1GB EIDE hard drive
- 3.5" floppy drive
- 8X EIDE CD-ROM drive
- PCI 64-bit graphics accelerator (2MB EDO)
- 17" Micron 17FGx, .26dp (15.8" display)
- Tool-free minitower or desktop
- Microsoft Mouse, 104-key keyboard
- Microsoft Windows NT™ Workstation
- Microsoft Office Pro 95 & Bookshelf® 95 CDs
- 5-year/3-year Micron Power warranty*

$3,257 Business lease $111/month

- With 166MHz Pentium processor....subtract $100

intel inside PENTIUM® PRO PROCESSOR

• 900 E. Karcher Road, Nampa, ID 83687
• Mon-Fri 6am-10pm Sat 7am-5pm (MT)
• International Sales Hours: Mon-Fri 6am-7pm (MT)
• 208-893-3434 • Fax 208-893-3424
• Purchase Order Fax 208-893-8992
• GSA Contract #GS35F4317D
• Technical Support Available 24 Hours A Day–7 Days A Week
• Technical Support E-mail: techsupport.meic@micron.com

International Sales 208-893-8970
International Fax 208-893-7393
Tollfree from Puerto Rico 800-708-1756
Tollfree from Canada 800-708-1758
Tollfree from Mexico 95-800-708-1755

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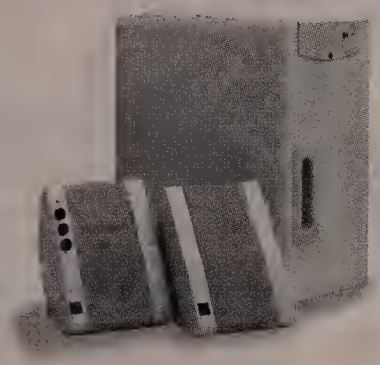
You Want More?

Custom configure your new Micron™ system with our most popular options.

Multimedia Options

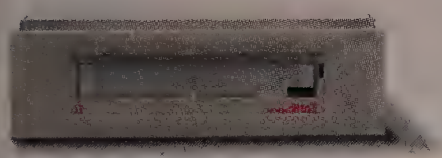
- 16-bit 3D Wavetable stereo sound.. $59*
- 16-bit 3D Wavetable stereo soundcard w/2MB RAM $99*
- Advent AV270 Powered Partners stereo speakers $99
- Advent AV370 Powered Partners stereo speakers w/subwoofer $199
- Microsoft® SideWinder™ 3D Pro joystick $59



Microsoft
WHERE DO YOU WANT TO GO TODAY?™

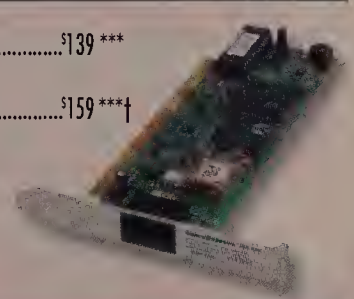
Storage/Media Options

- Adaptec 2940U Ultra SCSI Fast-20 controller $100
  (upgrade from system with standard Ultra SCSI Fast-20 controller)
- Plextor 8Plex 8X 1.2MB/S SCSI internal CD-ROM drive $200 **
  (upgrade from systems with standard 8X EIDE CD-ROM drive)
- Iomega SCSI Jaz drive with 1.0GB removable cartridge $399 **
- Iomega Zip IDE drive with 100MB removable cartridge $99
- Iomega Ditto 800 (400/800MB) Travan Tape back up w/tape $149
- Iomega Ditto 3200 (1.6/3.2GB) Travan Tape back up w/tape $199
- Sony 4/8GB DDS-2 DAT SCSI Tape back up w/tape $999 **



Communication Options

- 28.8bd V.34 internal data/fax modem $139 ***
- 28.8bd V.34 internal telephony data/fax modem
  w/full duplex speakerphone and voice mail $159 ***†

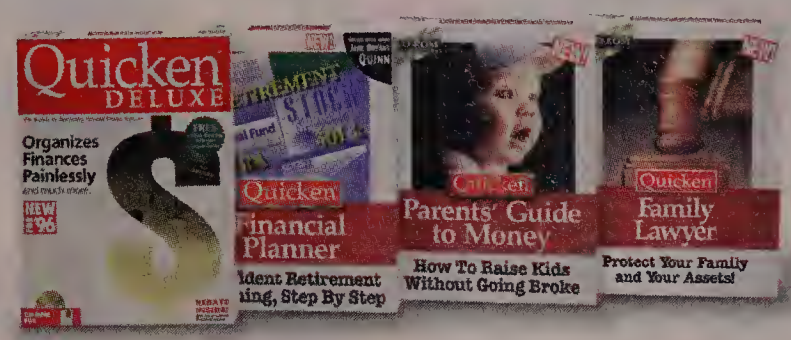


Networking Options

- 3Com® 3C509 Ethernet ISA NIC (BNC, AUI & RJ-45) $99
- 3Com 3C595 Fast Etherlink PCI 10/100 NIC (RJ-45 only) $159
- SMC ISA TokenCard network card $199

Quicken® Financial Pak

- Quicken Financial Pak, including: Quicken Deluxe 5.0; Quicken Financial Planner™; Quicken Parents' Guide to Money™; Quicken Family Lawyer™ $69

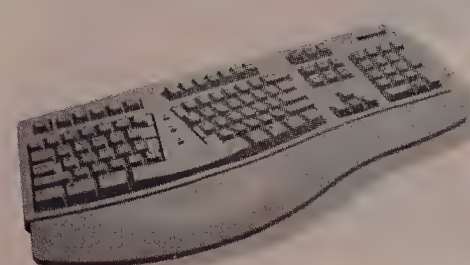


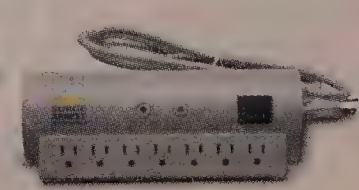
Display/Video Options

- 17" Hitachi SuperScan 1711 (15.9" display) .26dp color monitor $150 ††
- 21" Hitachi SuperScan 2111 (20" display) .26dp color monitor $1,050 ††
- Diamond Stealth64 video card w/2MB VRAM $150 †††
- Diamond Stealth64 video card w/4MB VRAM $300 †††
- #9 Imagine 128 series II video card w/4MB VRAM. $500 †††
- #9 Imagine 128 series I video card w/8MB VRAM $750 †††

Other Options

- APC Pro7T surge suppressor $39
- APC Pro7T surge suppressor $59
- Microsoft Natural Keyboard® $49
  (upgrade from standard keyboard)





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REALLY
WORKS

101 AMAZING WORD PROCESSING Tips

BY GEORGE CAMPBELL

Make your Windows word processor do it all with these incredible tricks and techniques

LAAAADIES AND GENTLEMEN! Step right up! The Amaaaazing Word-o-Matic is now on display! It makes letters, flyers, catalogs, invoices, and more! It slices! It dices! It even corrects your errors for you! And if you order your copy of the Amaaaazing Word-o-Matic today, we'll throw in a Web authoring tool *absolutely free!* BUT WAIT! THERE'S MORE...

Some of us still remember the days when a word processor did just one thing: process words. Today's Windows 95 word processors seem to do everything, and then some. How are you supposed to master a program that's part word processor, part spreadsheet, and part database, with some desktop publishing and Web tools thrown in for good measure? With lots of help, that's how.

That's why we've assembled a collection of 101 tips for the three major Windows word processors: Microsoft's Word 7 for Windows 95, Corel's WordPerfect 7 for Windows, and Lotus's Word Pro 96. Most of these tips apply equally well to their older, Windows 3.1 cousins. And as a bonus (we told you there was more), we provide keyboard shortcuts that apply to all three word crunchers, as well as hints on how to use Word for Windows as a Web authoring tool. Like what you see? Fire up your modem, because these and other tips are available on PC World Online. ▶

ILLUSTRATION BY J. OTTO SEIBOLD

TIPS

Word

MY DOCUMENTS, MY FOLDERS!

IN WORD 7, the default location for document files is the My Documents folder. But if you upgraded from Word 6, you probably stored your old documents somewhere else. Instead of moving your docs, change your default directory. Select *Tools•Options*, click the *File Locations* tab, then choose *Documents* in the *File Types* list. Click *Modify*, and either choose a different default directory from the list or click the *Create New Directory* button and create one on the fly.

A DRAG ALL THE WAY

WHILE WORD 6 AND 7 let you drag a block of text to a new location, that gets tricky if you want to drag it to a part of the document that's not visible on screen. The best solution is to split the document into two panels and drag text between them. Select *Window•Split*; a thin gray line will attach to your cursor. Drag the line to the middle of the screen and click the left mouse button. This creates two windows for the same document, with their own separate vertical scroll bars. Scroll the bottom window to the area where you want to insert the new text, then drop it in. When you're finished, select *Window•Remove Split* to restore the single window display.

THIS BUGS ME

A Few Choice Characters

PROBLEM: Whenever I try to select a few characters in one word and a few in the next, Word 7 insists on highlighting each whole word.

SOLUTION: Simply drag back to the first word and then drag forward again, or hold down **<Shift>**- or **<Ctrl>-<Shift>** and use the cursor keys. If this feature really annoys you, select *Tools•Options*, click the *Edit* tab, then click the *Automatic Word Selection* option to disable it.

INSERT GRAPHICS QUICKLY

DO YOU OFTEN insert a graphic, such as a logo or signature, into your documents? You can automate this process. Open a document containing that image, click the embedded graphic to select it, then select *Tools•AutoCorrect*. You'll see part of the graphic displayed in the With window. Type a short abbreviation like **mysig** in the Replace box, making sure it's not a word you normally type, then click *OK* to add it your AutoCorrect list. The next time you type the abbreviation, Word will automatically insert the graphic.

EDIT IN PRINT PREVIEW

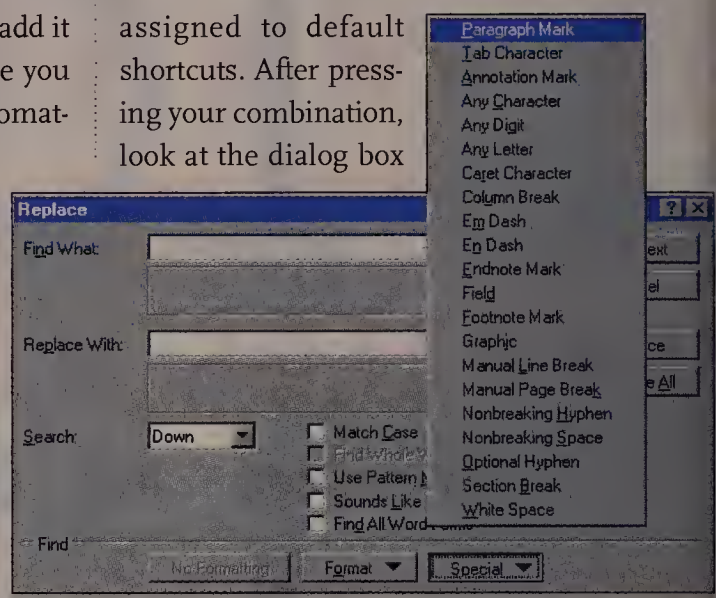
DO YOU EVER need to edit a document while in Word's Print Preview mode? Click the magnifying-glass button on the toolbar to switch your pointer to the standard I-beam. To enlarge the preview so the text is legible, click the zoom control and pick a larger value (say, 75 percent) from the drop-down list.

RESIZE AND SCALE GRAPHICS

AFTER IMPORTING A GRAPHICS FILE with the Insert•Picture command, you often need to change its size. To do this, first click the graphic to display its sizing handles. To resize the graphic without changing its proportions, click and drag the corner handles. Use the middle handles to resize with different proportions. To crop the graphic so that only a portion of it is displayed, hold down **<Shift>** and drag a handle. To return the image to its original size, hold down **<Ctrl>** and double-click the graphic.

TYPE THE UNTYPEABLE, PART I

DO YOU OFTEN insert the same non-keyboard characters (such as a smiley face or a pointing finger) into your documents? You can do this much faster by assigning a keyboard shortcut to the symbol. First, select *Insert•Symbol*, then select either the *Symbols* or *Special Characters* tab. Choose a symbol font that contains the character you want. Click that character, then click *Shortcut Key*. In the Customize dialog box, look at the Current Keys box to see whether a shortcut key is already assigned to this character. If not, press the desired key combination for your shortcut. In most cases, **<Ctrl>-<Alt>-*key*** and **<Shift>-<Ctrl>-<Alt>-*key*** combinations are not assigned to default shortcuts. After pressing your combination, look at the dialog box just above the *Description* frame to see whether your choice is currently assigned. If not, or if you want to replace the current assignment, click *Assign*. Click *Close* to make the keystroke permanent.



SEARCH FOR NONPRINTABLES To find characters such as tabs or paragraph marks in a Word document, click *Special* in the Find or Replace dialog box, then select the item you're looking for.

TYPE THE UNTYPEABLE, PART II

TO INSERT a trademark symbol (™), press **<Ctrl>-<Alt>-T**. Pressing **<Ctrl>-<Alt>-R** inserts the registered trademark symbol (®), while **<Ctrl>-<Alt>-C** inserts the copyright symbol (©).

STYLIN' MARGIN

IF YOU USE DIFFERENT paragraph styles in the same document, knowing which styles are used in each section can help you keep an eye on your work. The easiest way is to have Word show the style for each paragraph in the left-hand margin. To set this up, select *Tools•Options* and click the *View* tab. In the *Window* frame, increase the *Style Area Width* setting to 0.5 inch, then click *OK*. Need to edit a style? While the style area is displayed, double-click a style name to get to the *Style* dialog box.

REPEATED SEARCHES

MOST USERS KNOW that pressing <Ctrl>-F calls up the Find dialog box. But did you know that pressing **<Shift>-<F4>** repeats the last search, bypassing the dialog box?

COMMON KEYBOARD SHORTCUTS

THE MAJOR WORD processors may claim to be different, but they all speak a universal language—at least when it comes to keyboard shortcuts. The following keystrokes work in any of the three word processors discussed in this article. You'll probably find using them a lot more productive than constantly switching between keyboard and mouse.

Navigation	
Go to beginning of document	<Ctrl>-<Home>
Go to end of document	<Ctrl>-<End>
Go to end of line	<End>
Go to beginning of line	<Home>
Go to beginning of next word	<Ctrl>-<Right>
Go to beginning of previous word	<Ctrl>-<Left>
Go to beginning of next paragraph	<Ctrl>-<Down>
Go to beginning of previous paragraph	<Ctrl>-<Up>
Go to next open document	<Ctrl>-<F6>
Go to previous open document	<Ctrl>-<Shift>-<F6>
Selection	
Select character to right	<Shift>-<Right>
Select character to left	<Shift>-<Left>
Select word to right	<Ctrl>-<Shift>-<Right>
Select word to left	<Ctrl>-<Shift>-<Left>
Select to end of line	<Shift>-<End>
Select to beginning of line	<Shift>-<Home>
Select to end of document	<Ctrl>-<Shift>-<End>
Select entire document	<Ctrl>-A
File management	
Save	<Ctrl>-S
Print	<Ctrl>-P
Close current document	<Ctrl>-<F4>
Formatting	
Bold	<Ctrl>-B
Underline	<Ctrl>-U
Italic	<Ctrl>-I

BE AN INK-JET-SETTER

IF YOUR DOCUMENT footers or headers don't print on your ink jet printer, it's probably because Word is trying to print them too close to the edge of the paper, which ink jets can't handle. Here's the solution. Select *File•Page Setup*, and click the *Margins* tab. In the From Edge box, set the Header and Footer values to 0.7 inch or more. To make this the new default for all documents, click *Default*, then *Yes* when Word asks you to confirm the selection.

INSTANT FORMATTING INFORMATION

EVER NEED QUICK information about the formatting of text, graphic images, or other objects in your document? Click the *Help* button on the far right of the standard toolbar (the one that looks like a pointer arrow with a question mark), then click on the text or object to get a Help bubble. When you're done, press **<Esc>** to restore the normal pointer.

1, 2, 3, GO!

SO YOU'RE READING page 13 of a document and need to get to page 178? You can quickly access Word's Go To dialog box by double-clicking the page number area on the status bar or by pressing **<F5>**. Type the correct page number inside the dialog box, and you're there.

SPEEDY SELECTIONS

NEED TO GRAB TEXT in a hurry? Click in the blank area just to the left of your text to select the current line. Double-click to select the paragraph. Triple-click or press **<Ctrl>-A** to select the entire document.

PRECISION TOOL

WORD'S RULERS make it easy to adjust margins, columns, and tabs, but setting them precisely can be difficult, since the ruler is divided only in 10ths of an inch. To see more precise measurements, hold down the **<Alt>** key while you click on or drag a margin, column, or tab marker. The precise dimension will appear on the ruler.

DOWN PARAGRAPH!

TO ADD SPACE above a particular paragraph, press **<Ctrl>-0** (zero) with the cursor anywhere in the paragraph. Note that this is not a hard return, so you can avoid accidental deletions. The only way to remove this space is by pressing **<Ctrl>-0** again.

SHIFTING FOR STYLE

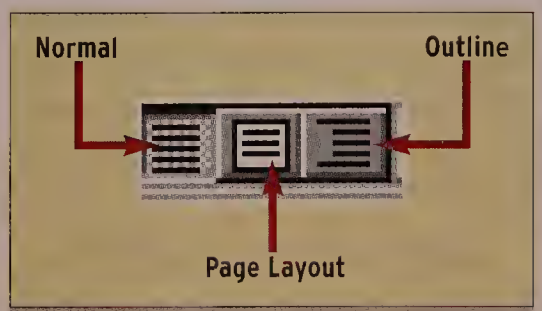
THE DROP-DOWN STYLES LIST on the standard Formatting toolbar is a quick way to select styles for text in your documents, but it normally displays only a few of the styles available in Word. To see all the available styles, such as the Table of Contents or Envelope styles, hold down **<Shift>** while you click the arrow to the right of the list.

EXTEND-A-TABLE

IF YOU NEED TO ADD a number of rows or columns to an existing table, drag the mouse in your current table to highlight the number of rows and columns you want to add, starting where you need the new rows or columns. Right-click that selection, and select *Insert Cells*. If you selected an entire column or row, select *Insert Columns* or *Insert Rows*.

TABLE BE GONE!

THE PROBLEM WITH WORD'S TABLES is that they just don't know when to leave. Pressing **<Delete>** with a table selected ▶



QUICK SWITCH: Instead of using Word's menus to switch between the Normal, Page Layout, and Outline views, use these icons on the horizontal scroll bar.

WORD GOES WEB: INTERNET ASSISTANT

FROM DOC TO HTML IN NO TIME

PROBLEM: I need to convert a complex Word document into a Web page. It has been formatted with styles, and it contains several embedded graphics and Excel tables.

SOLUTION: Open your file in Word and select *Save As.* In the *Save as type* drop-down list, select *HTML Document (*.htm).* Internet Assistant converts Word styles to the closest available HTML styles. (If you've created your own styles, see the help system for how to map them to HTML styles.) Embedded graphics and OLE objects such as Excel tables will convert to GIF images. The new GIFs, named Img00001.gif, Img00002.gif, and so on, are kept in the same directory as your document. Once the conversion is complete, rename the GIFs so they are recognizable, and adjust their links in your document.

EASY AS A STENCIL

PROBLEM: All the pages on my Web site have the same formatting and layout, and I keep having to repeat the same steps whenever I create a new one.

SOLUTION: Create a Web page template. Open an existing HTML document in Word, replace the existing text with generic labels such as Page banner, Body text, List item, and so on. Select *Save As.* In the *Save as type* field, select *Document Template (*.dot).* Give the file an appropriate name (for example, Web Catalog Template), and click *OK.* You'll be asked if you'd like to save the new template with Word's Normal template or the Internet Assistant template attached. Select the latter. When you're ready to update your site, select *File•New* and double-click that template's icon.

FIX UNEVEN SPACES

PROBLEM: I often insert horizontal lines between blocks of text. When I preview the pages in a Web browser, the rules are surrounded by uneven space—too little before, too much after.

SOLUTION: Internet Assistant adds a new paragraph tag after horizontal rules. Select *View•HTML Source.* Scroll until you see <HR>, the HTML tag for a horizontal rule. Delete the <P> that follows it, and click *Return to Edit Mode.*

IT'S ALL RELATIVE

PROBLEM: Whenever I add a graphic element to a new, as yet unsaved document I lose the link to its file in the version that I post to my World Wide Web site.

SOLUTION: When you create a link in an unsaved document, Internet Assistant creates a link to a fixed file location rather than to a relative address. To avoid this, always save a document before you start embedding links in it. But if you've already established a link in an unsaved document, here's what to do: Double-click the afflicted GIF, click the *Link Path* button, and uncheck the *Use fixed file location* option. Click *OK.*

RETURN TO EDITOR

PROBLEM: While editing the HTML source, I sometimes accidentally close the window that contains the Close button (which allows me to return to HTML edit view). How do I get back?

SOLUTION: That button is a just a floating toolbar. Right-click the Word toolbar, select *HTML* from the pop-up menu, and that button will reappear.

—Asha Dornfest

deletes only its contents, not the table itself. To remove the table, click anywhere inside the table with the mouse, press **<Alt>-5** using the numeric keypad to select the table or use *Table•Select Table*, right-click the selected table, and select *Cut.*

MAKE YOUR OWN SHORTCUTS

NOT EVERY MENU COMMAND in Word has a corresponding keyboard shortcut, but that doesn't mean you can't create one of your own. Hold down **<Ctrl>-<Alt>** and press **+** on the number pad. The mouse pointer will change to a special symbol. Select a menu command or toolbar button with this cursor to pop up the Customize dialog box. Press your desired keystroke combination, check for conflicts below the Press New Shortcut Key box, and click *Assign*, then *Close.*

CLOSE ALL DOCUMENTS INSTANTLY

IF YOU NEED TO CLOSE all currently open documents with just one command, hold down **<Shift>** while you select *File.* The Close command will be replaced with *Close All.* Select that option to close all your documents. If you have any unsaved documents, you may be prompted to save them, one by one.

CLEAN UP CLUTTERED MENUS

WANT TO REMOVE an unused command from a menu? Press **<Ctrl>-<Alt>-<Hyphen>**. Your pointer will change to a thick minus sign. Click the menu, then the command you want to remove. To restore an entry, select *Tools•Customize,* click the *Menus* tab, and select the menu you want to configure and the command you want to restore. Click *Add,* then *Close.*

MOUSELESS CONTEXT

WANT TO DISPLAY one of Word's context-sensitive shortcut menus without having to click your right mouse button? To do this, just move your cursor to the entry you want, then press **<Shift>-<F10>**.

BUTTON REMOVAL

TO REMOVE AN UNWANTED BUTTON from a toolbar, hold down **<Alt>** while you drag the button off the toolbar and into the document window. But be sure this is what you really want, because there's no automatic way to undo this move. If you change your mind, you'll need to right-click the toolbar, select *Customize,* scroll down the Categories list until you find that icon, then drag it to up the toolbar. ▶

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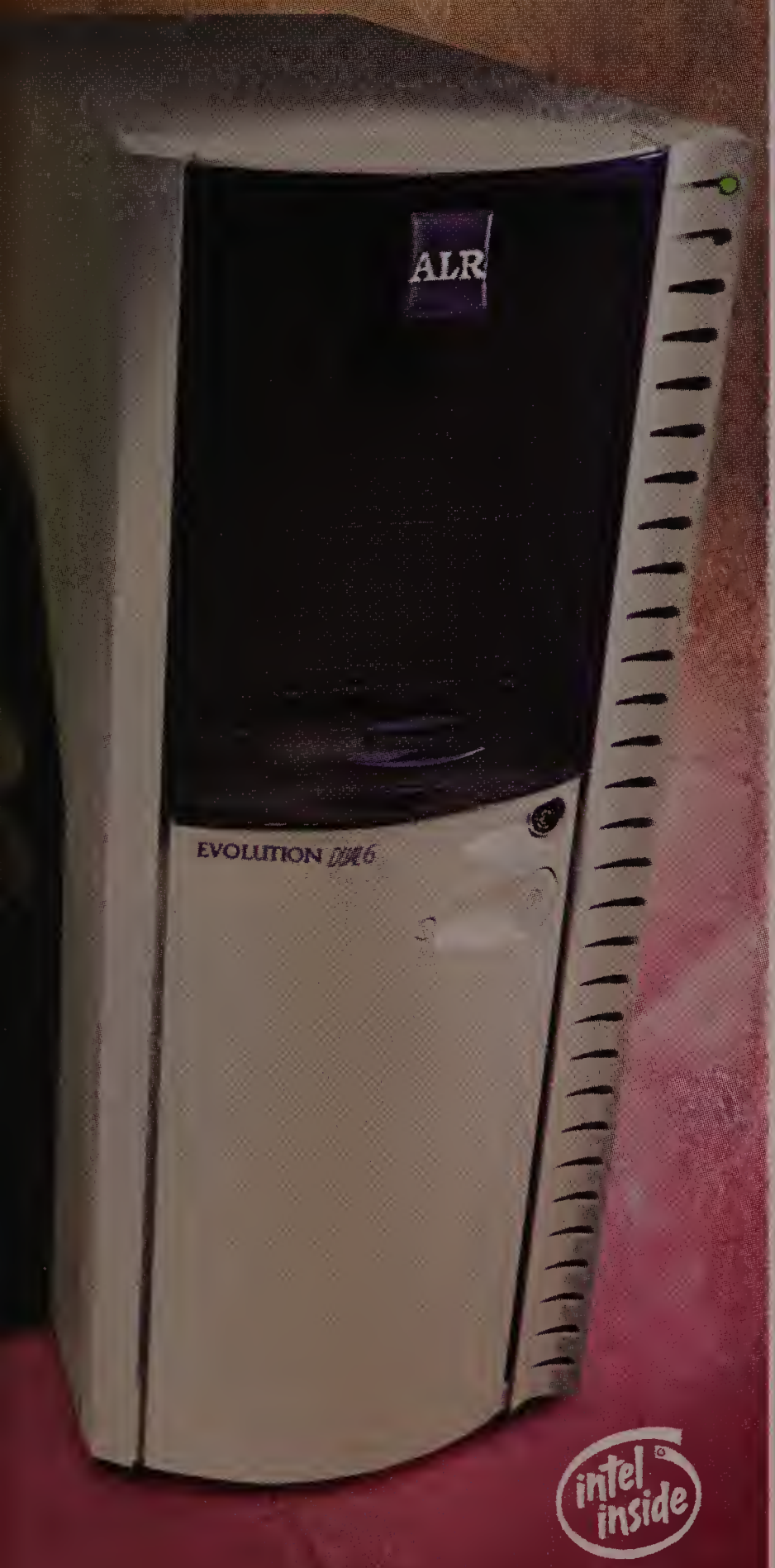

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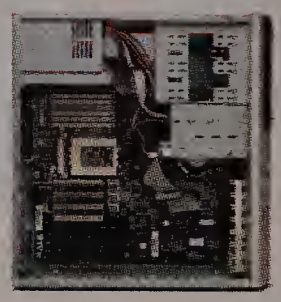

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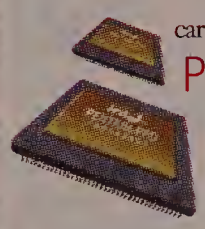

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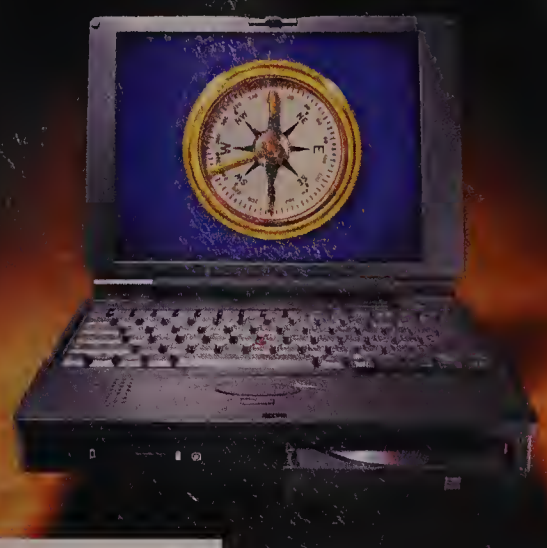

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TEXAS INSTRUMENTS

Circle 235 on reader service card

THIS BUGS ME

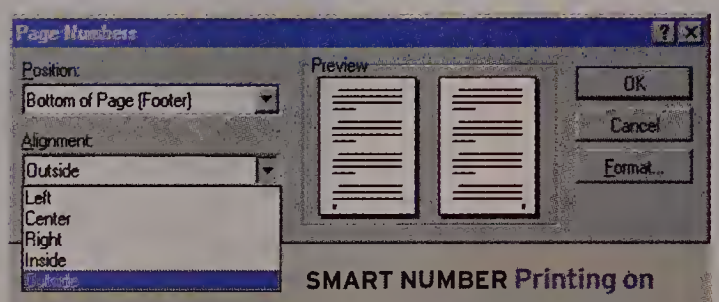
What's Up, .doc?

PROBLEM: No matter what extension I give my documents, Word 7 insists on tagging on the .doc extension, so I get file names like budget.89.doc. Is there a way around this?

SOLUTION: Type quotes around the file name in the Save As dialog box (for example, "budget.89"), and Word will accept it without forcing the default extension.

KEEP 'EM TOGETHER

SO YOU'VE APPLIED automatic hyphenation to your Word document, but there's a section of text that you don't want to hyphenate? Just select the appropriate text, right-click your selection, select *Paragraph*, click *Text Flow*, and select *Don't Hyphenate*. This technique is quite handy for social security numbers, phone numbers, and any other type of text that you wouldn't want to break across lines.



SMART NUMBER Printing on both sides of the paper? Here's how to add page numbers to the outside bottom corner of each page. Select *Insert•Page Numbers*, then select *Outside* in the Alignment list and click *OK*.

LOVE THOSE DEFAULTS

TO RESTORE A TOOLBAR to its default settings, right-click on the toolbar, select *Toolbars* from the pop-up menu, choose the toolbar you want to fix, and click *Reset*. Click *OK* twice to finish the job.

FULL VIEW

DOES TEXT KEEP SCROLLING off your screen? Word can display your document so it fits the width of the window. On the standard toolbar, click the drop-down–list arrow next to the Zoom Control (which displays the current zoom level as a percentage of actual size), and select *Page Width*.

UNTIL THERE'S A KLINGON DICTIONARY...

THE SECTIONS OF A Word document that contain foreign language or technical jargon can cause headaches when you run a spelling checker, because your word processor will prompt you to check each and every one of these specialized words. To force Word to skip over specific passages during checks, select the text, select *Tools•Language*, and click *(no proofing)*.

EVERY CHARACTER COUNTS

WORD'S STANDARD Tools•Word Count command will count the number of characters in a selection of text for you, but it has a habit of ignoring the spaces between words. When every character counts, use Microsoft's free enhanced Word Count, which can be downloaded from the company's world Wide Web site (http://www.microsoft.com/MSOffice/MSWord/FreeStuff/fs_wd_wdconvert95.htm). Install this utility in your \Winword\Startup group, and it'll add itself to your Tools menu. The next time you run Word Count, you'll have the option to count spaces too.

THIS BUGS ME

Dodging Fake Bullets

PROBLEM: I often get e-mail messages with mock bullets (spaces and hyphens) inserted at the beginning of each line. I want to convert them to Word bullets, but there's too much junk at the beginning of each line—spaces, asterisks, and so on.

SOLUTION: Hold down <Alt>, click at the upper left corner of the text, then drag the mouse over the desired area, selecting the spaces and other offending characters in front of each line. When you're done, let go of the mouse button and press <Delete>. You may need to repeat this for some stray spaces. Now block-select the text and apply real bullets by clicking the *Bullets* button on the toolbar.

WordPerfect

DON'T LOSE THE WRAPPER

TO CREATE A FILE that will import and reformat easily in other programs, don't just save it as ASCII. Instead, choose *ASCII (DOS) Generic Word Processor (*.*)* format when you use WordPerfect's Save As command. If you use the *ASCII (DOS) Text (*.*)* format, WordPerfect will add carriage returns to the end of each line, thereby losing the word wrap and making it a pain to import the document into another application.

EXPAND THE CLIPBOARD

THE WINDOWS CLIPBOARD can hold only one item at a time. Fortunately, WordPerfect has a way around this restriction. To add to the contents of WordPerfect's clipboard, select the part of your document you want to paste, and select *Edit•Append*. You may repeat the process as many times as you want.

BACK TO WORK

IF YOU USE LONG DOCUMENTS frequently, you'll be happy to know that the next time you launch WordPerfect, you can start work at the place where you left off. Select *Edit•Preferences*, then double-click the *Environment* icon. Click *Always* in the Save Workplace frame. Click *OK*, then *Close*. WordPerfect will start each subsequent session by loading the documents you used in the last session and placing the cursor right where it was when you exited the program.

CHANGE DEFAULT FONT

YES, IT'S POSSIBLE TO CHANGE WordPerfect's default font, but this option is buried where you'd least expect it. With a blank document on the screen, select *File•Print•Select*. Choose the printer you normally use, if it's not already selected. Select *Options•Initial Font*. In the Printer Initial Font dialog box, select the font name and size you want to use for all documents, then click *OK*. Click *Select* in the Select Printer dialog box, then select *Close* in the Print dialog box. ▶

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FINDING HIDDEN TEXT

HIDDEN TEXT formatting in WordPerfect is useful for annotating documents, but it's hard to tell which text is formatted as hidden text while you're editing, since it looks just like normal text. Here's how to identify hidden text on screen. Select the text you want to format as hidden, then select *Format•Font*. Click the *Hidden Text* check box in the Font dialog box, then go to the Color Options area and pick a color other than your normal text color. Click *OK* to apply the formatting. Note: Hidden text will print when it is displayed. To prevent this text from being printed, go to the *View* menu and deselect *Hidden Text* before you print.

CIRCUMVENTING OLE

TO EDIT OBJECTS embedded in a document, just double-click them. Object Linking and Embedding 2.0 lets you edit them from within the document, without launching their native applications. In some cases you may need to open those apps, particularly if you want to work with other files. To do this in WordPerfect, hold down **<Alt>** while double-clicking the object. That will start the application with the object loaded. Don't worry; by doing so, you don't lose your OLE functionality.

DISPOSABLE MACROS

EVERY ONCE IN A WHILE you need to record a macro to perform a series of repetitive tasks for just that session. To do this, select *Tools•Template Macro•Record*, and click *Record* in the Record Template Macro dialog box. Make sure you don't type anything in the Name field. Record the desired commands, then select *Tools•Template Macro•Record* again to stop recording the macro. To use the macro, select *Tools•Template Macro•Play*, then click *Play*, without entering a name.

TOP 15 ONLINE RESOURCES

WE'D LOVE TO TELL YOU that this article has all you need for using your word processor more effectively, but that would be a *slight* exaggeration. You can find infinite volumes of tips, FAQs, and other types of help online. We've rounded up the top 15 sites on the Web and on CompuServe. And there's more to this list than meets the eye: Most of these Web sites offer links to dozens of other useful resources. —Aoife McEvoy

All word processors

http://www.wordinfo.com/links/tiplist.htm
Links to dozens of great tip and FAQ sites.

http://www.hic.net/goliad/wordbk.htm
Word processing resource pages; links to other sites; shareware.

Word

CompuServe: go winword
One of the most active user-to-user and tech support message boards on CompuServe. For all versions.

http://www.microsoft.com/support/products/office/word.htm
Microsoft Online Support; extensive knowledge base; tons of FAQs; feature articles; free software; links to newsgroups and more. For Word 6 and 7.

http://www.nd.edu/~crunge/word.html
The Unofficial Microsoft Word for Windows Home Page: links to other support sites; tips, tricks, macros, templates and newsgroups. For Word 6 and 7.

http://www.sni.net/wopr/
WOPR offers various goodies: add-ins for Office '95; tips and technical support options. For Word 7.

WordPerfect

CompuServe: go wpwin
Corel's forum features active message boards for technical support issues and user-to-user interaction. For WordPerfect for Windows.

Usenet newsgroup: news:bit.listserv.wpwin-l
Never mind customer support; talk to the real Usenet newsgroup experts—users like you, some of whom are real gurus. For WordPerfect 6.1 and 7.

http://daedalus13.mc.duke.edu/faq/WPWin2.html
A good collection of FAQs, tips, and links to other sites. For WordPerfect 6.1 and 7.

http://www.rci.rutgers.edu/~dmikov/wp.htm
A wealth of tips, techniques, articles, macros and templates; useful software and add-ons; links to other sites and newsgroup access. For WordPerfect 6.1 and 7.

http://www.wpmag.com
WordPerfect Magazine: Quick and easy shortcuts to customize your settings and speed up your work. For WordPerfect 6.1 and 7.

http://www.corelnet.com/corelnet/resource.htm
CorelNet is a good place to start: tips and tricks; article excerpts; knowledge base; newsgroups. For WordPerfect 6.1 and 7.

Word Pro

CompuServe: go frm-558
A Lotus-operated customer support forum and user-to-user message board. For Word Pro 96.

http://www.lotus.com/wordpro/street.htm
Lotus Development's Word Pro Street—all you need to know: FAQs and a slew of tips and tricks. For Word Pro 96.

http://tile.net/smartnotes/technical9.html
Word Pro FAQs. For Word Pro 96.

SHRINK TO FIT

THE FORMAT•MAKE IT FIT EXPERT is great for making a document fit onto fewer pages. But this Expert affects ▶

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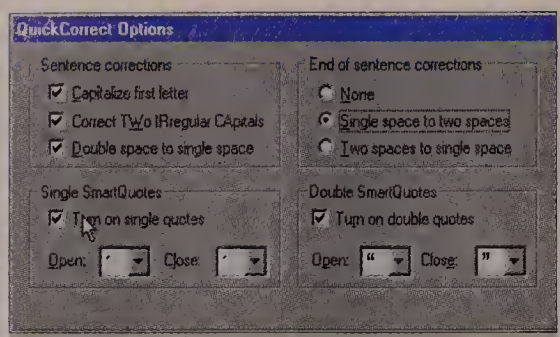


IF YOU TYPE TWO SPACES at the end of a sentence but your company insists on one, WordPerfect 7 can help. Select *Tools•QuickCorrect*, click the *Options* button and make your selection.

only text, margins, and line spacing. It cannot change the size of graphics or tables. So if you're going to shrink a document that has these elements, it's a good idea to resize them before using the Expert.

USE DEFAULT MENUS

IF YOU'VE EVER INHERITED somebody else's copy of WordPerfect and it seems a little strange, it's probably because that person customized the program's menus. But don't fret. You can revert to the standard WordPerfect 6.1 menus by pressing **<Shift>-<Ctrl>-<Alt>-<Backspace>**.

DOCUMENTS AT A GLANCE

TO PRINT A LIST of your files complete with directory information, select *File•Open*, then set the Open File dialog box to display the directories and files that you want to list. Click *File Options*, then click *Print File List*. Click *Print*, then select *Cancel* to close the Open File dialog box.

INSTANT GO TO

DON'T WANT TO GO through the menus to use the Go To command? Right-click any scroll bar to display a menu that shows the *Go To*, *Bookmarks*, and *Preferences* commands.

CORRALLING TEXT BLOCKS

TO USE YOUR MOUSE to select a vertical block of text, hold down **<Shift>** while you right-click and drag the mouse from the upper left corner of the block to the lower right corner.

THIS BUGS ME

Selective Selection

PROBLEM: When I select a few words with the mouse, WordPerfect won't let me extend the selection to the first letter or letters of the last word in the selection, but insists on highlighting the entire word.

SOLUTION: Hold down **<Alt>** as you click and drag, and you'll be able to select any portion of the last word.

STYLES BY EXAMPLE

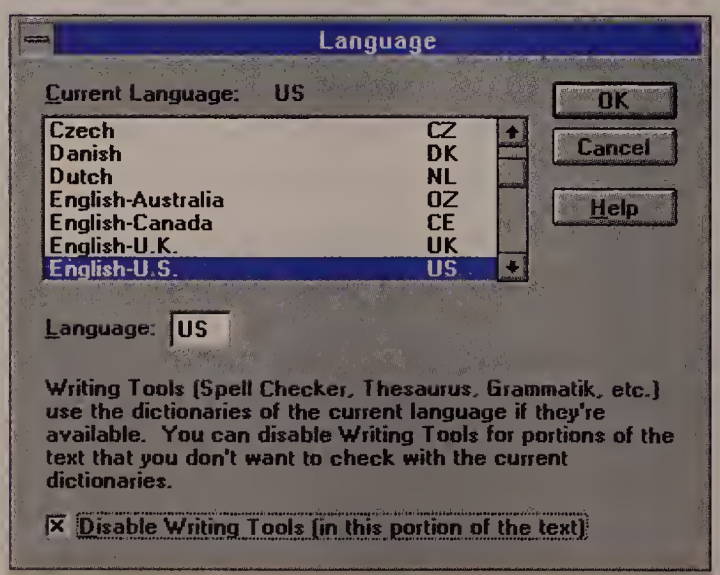
HERE'S A GREAT WAY to avoid using WordPerfect's notoriously confusing Style feature: Format text in a document, select *Format•Style*, then click *QuickStyle* to create a new style based on the selection.

CUSTOMIZE THE BAR

THERE'S MORE TO THE STATUS BAR than meets the eye. To add functionality to that bottom line, right-click the status bar, then select *Preferences*. Mark items you want included on the status bar (Date and Time are great ones), unmark those you want removed, then click *OK*. This isn't just for display: Most items in the status bar are clickable.

RAPID-FIRE BULLETS

IF YOU'VE INSERTED a bullet or number in your document using the *Insert•Bullets & Numbers* menu option, insert another of the same item later, anywhere in the document, by pressing **<Shift>-<Ctrl>-B**.



PARLEZ HUH? In WordPerfect 6.1, you can selectively disable the spelling checker. Select the text, then select *Tools•Language*. Click *Disable Writing Tools*.

Word Pro

EASIER ON THE EYES

IF WORD PRO'S DEFAULT bright-white background is hard on your eyes, here's some relief: Right-click in the editing area of a blank new document and select *Page Properties*. In the InfoBox, click the *Page Lines & Colors* tab, then drop down the *Background* color list. From the color grid, pick a light color that works for you, then close the InfoBox. To save these settings, select *File•Save As*. In the *Save as type* drop-down list, choose *Lotus Word Pro SmartMaster (*.MWP)*, then locate and select *default .mwp* (normally in the lotus\smasters\wordpro directory) in the file/folder list. Click *Save*, and answer *Yes* when prompted to overwrite the file. Normally, this background color would print as a shade of gray, but you can prevent it from printing. Select *File•Print*, then click *Options* and click *On preprinted form*. Select *OK* to close the Options box, then *Print*.

SEE-THROUGH FRAMES

FRAMES ARE GREAT tools for desktop publishing, but if you don't configure them correctly, they can obstruct text on the page. To make a frame transparent so background text or other frames show through, right-click the frame, then select *Frame Properties*. Click the *Frame Lines and Colors* tab in the InfoBox, then select *None* in the *Pattern* drop-down palette.

UNWELCOME SCREEN

TIRED OF THE "WELCOME" BOX that greets you every time you start Word Pro? Select *File•User Setup•Word Pro Preferences*. Drop down the *Disable* list, and click *Welcome Dialog*.

PASTE TEXT INTO A TABLE

WHENEVER YOU PASTE multiple paragraphs of text (or text with tabs) into a single table cell, you lose hard returns and tabs, wreaking havoc with your table. To force these elements into the table, click in the target cell, then select *Edit•Paste* ▶

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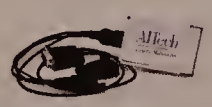

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Circle 11 on reader service card

WHEN YOUR WORD PROCESSOR ISN'T ENOUGH

Today's word processors are powerful, but they can't do it all. Third-party vendors have come up with tools to help fill some of the gaps. There are dozens of such programs, but the selection listed here should give you a good start.

Task	Product	Description
HTML authoring	**Internet Assistant for Word 6 and 7** free, downloadable from http://www.microsoft.com/msword/internet/ia/	Turn Word documents into Web pages.
Generate bibliographies	**EndNote Plus** $299, Niles & Associates, 510/559-8592	Excellent tool for students, college professors, researchers, and anybody else who needs to automate bibliographies. Doesn't yet support Word Pro.
Enhance Word	**WOPR 6 and WOPR 95** $49.95, Pinecliffe Int'l, 314/965-5630	Several powerful menu and interface enhancements as well as printing features.
Turn Word into a PIM	**Info Accelerator** $99.95, Baarns Publishing, 800/377-9235	Customizable, full-fledged contact manager includes great mail-merge tools, a calendar, a phone log, and more.
Manage files in Word 7	**FileManager Junior** shareware, available on PC World Online, registration fee: $19.95	Simplifies file management in Word 7; much faster than the Save As or File Open dialogs.
Write better letters	**Lifetime Encyclopedia of Letters** $69.95, Streetwise Software, 800/743-6765, or as shareware from PC World Online	850 letters for every business need; integrates with your word processor's menus.

Special instead of pressing <Ctrl>-V. In the As list, select *Rich Text Format.*

SPEED UP WORD PRO

IF YOU'VE GOT LESS than 16MB of RAM, Word Pro can feel downright poky. To speed it up, consider these options: 1. Cut down the number of fonts installed in Windows; 2. Reduce the number of undo levels (select *File•User Setup•Word Pro Preferences*, click the *General* tab, and set the Undo levels value to fewer than the default of 100 levels); 3. In the same dialog box, drop down the Disable list and select *Small file format, OLE unless required*, and *Background Spell Check.*

You'll sacrifice some functionality, but you'll notice a significant speed boost.

EMBEDDING FONTS

TO ENSURE that other users see your file the way it appears on your system, embed the fonts in the document. Select *File•Document Properties•Document*. Click the *Options* tab, then select *Embed fonts in document*. Note: As TrueType fonts tend to consume anywhere from 10K to 250K, the saved document could be considerably larger.

CHANGE CELL HEIGHT

WORD PRO adjusts a cell's height based on its contents. To set a custom height, right-click in a cell and select *Cell Properties* from the menu that appears. Click the *Table Cell Size & Margins* tab, then click *Automatic row height* to deselect that option. Once this is done, you can resize the cell.

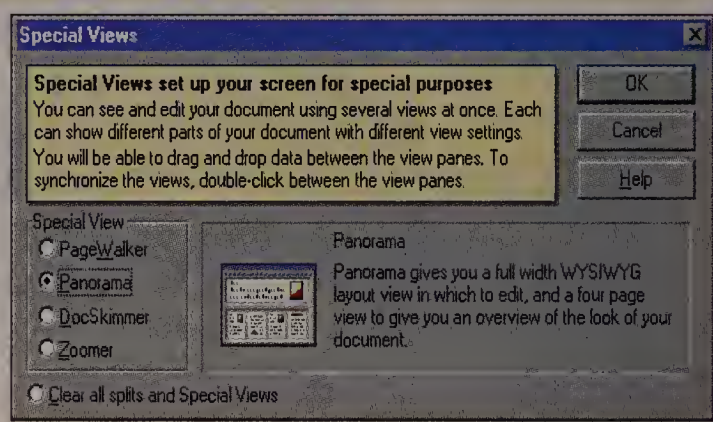
BULLETS OVER TABLES

WORD PRO AUTOMATICALLY indents the text that follows bullets. But if you copy bulleted text into a table or a frame, you lose the indent and the text doesn't get aligned properly. The solution is simple: Select the text to copy or cut, then press **<Alt>-<Enter>** to open the Text Properties InfoBox. Click the *Text Alignment* tab, then click *Options*. Click *Ignore indent when not in main body of document.*

ROTATE TEXT IN TABLES

TO PLACE TEXT VERTICALLY in column heads, select the cells you want to rotate, then right-click and select *Cell Properties*. Click the *Misc* tab, then *Text Direction.* ■

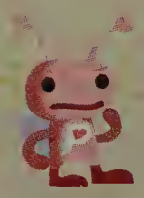
George Campbell is a contributing editor for PC World. *Asha Dornfest (asha@dnai.com) is the author of* Do-It-Yourself Web Publishing with Word *(Sybex, 1996, 510/523-8233). Aoife McEvoy is an assistant editor for* PC World.



CUSTOM VIEW Set up your Word Pro viewing options using *View•Special Views.* But save the views for final editing since they can be a bit slow to update.

THIS BUGS ME

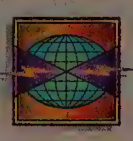
Directory Assistance



PROBLEM: Whenever I try to save or open a file, I need to tell Word Pro which directory to go to, even though I've already used that directory in the current session.

SOLUTION: Tell Word Pro to use the directory you most recently accessed in the Open or Save As dialog boxes. Select *File•User Setup•Word Pro Preferences*, then click the *Locations* tab. Select *Use working directory* to enable that option, then click *OK.*

I N T E R N E T

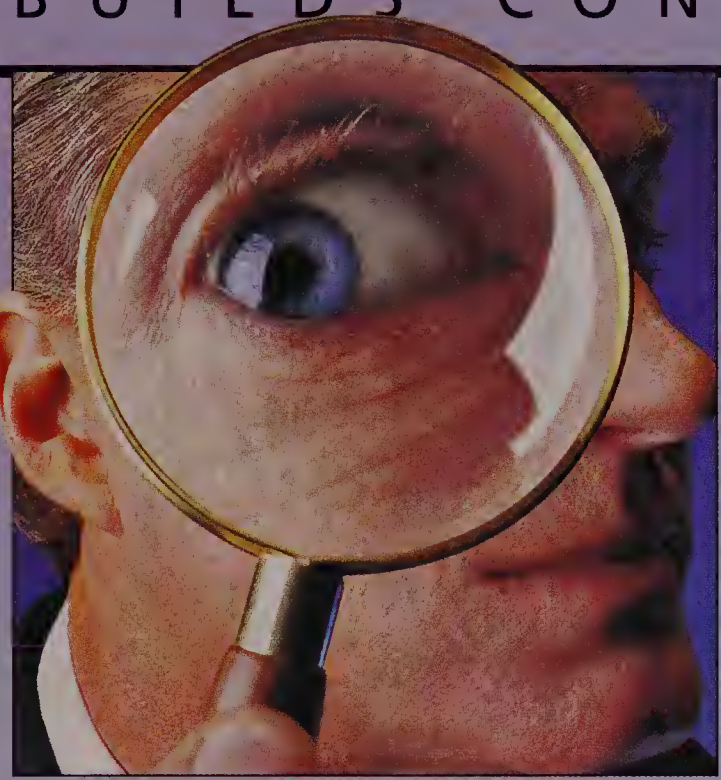


BUT WAIT! There's more! In addition to these amazing tips, PC World Online gives you links to the shareware programs and sites mentioned in this article. Log on now! Operators are standing by! **http://www.pcworld.com**

The Vision

EYE CONTACT

AUSTIN BUILDS CONFIDENCE



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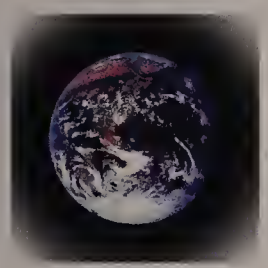

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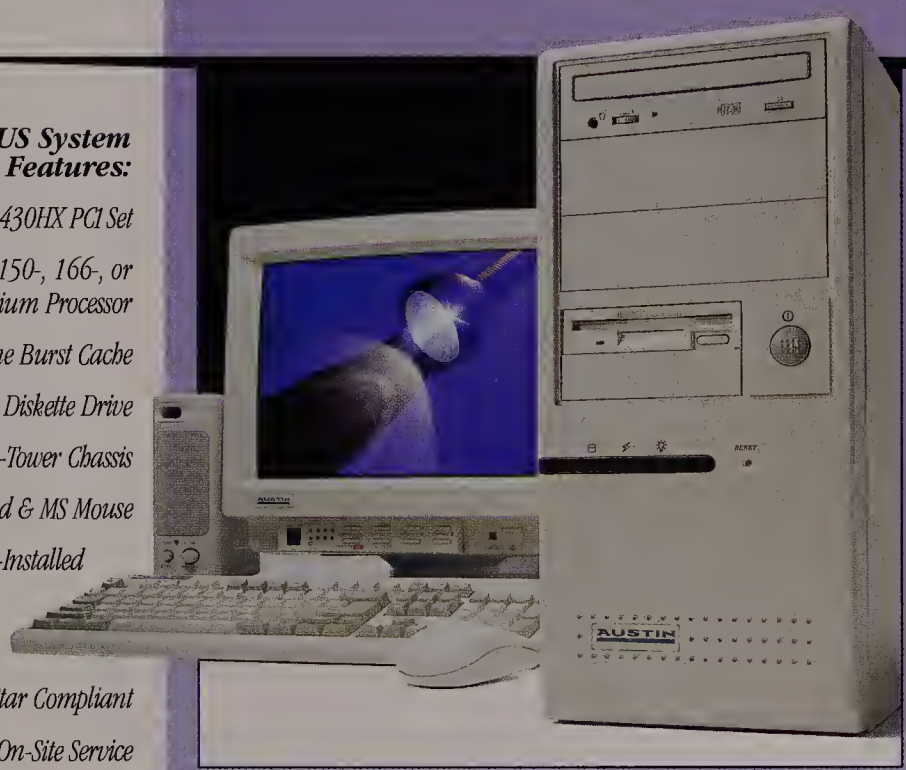

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One-Year On-Site Service

Austin PowerPLUS 133

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64-Bit PCI Video Accelerator – 2MB DRAM

8X IDE CD-ROM Drive, 16-Bit Audio, 40W Stereo Speakers

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Mid-Tower ATX Chassis

Win '95 Keyboard & MS Mouse

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Austin Élan Workstation 180

180MHz Intel Pentium Pro Processor

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64-Bit PCI Video Accelerator – 2MB VRAM

8X IDE CD-ROM Drive, 16-Bit Audio, 40W Stereo Speakers

15" .28mm NI SVGA Monitor

Business Lease: ***$93 / month***

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VISION

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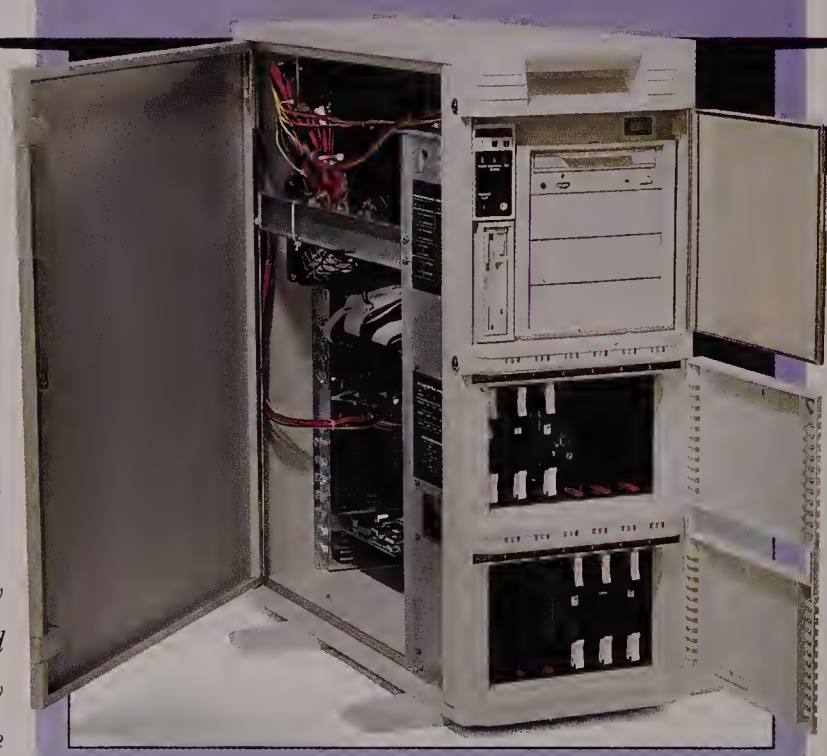

Austin Affinity XR-Pro Server Standard Features:

Intel 440FX PCI Set
256K L2 Cache
6X SCSI CD-ROM Drive
16-Bit Video
3.5" 1.44MB Diskette Drive
10Base-T PCI Network Adapter
4 ISA, 4 PCI, and 1 Shared Expansion Slot
Tower Chassis (26"H x 10" W x 25.5"D)
300W Power Supply
101-Key Keyboard
Three-Year Parts & Labor Warranty
One-Year On-Site Service

Austin Affinity XE and XE Pro Standard Features:

Intel 450GX PCI Set
Affinity XE: 512K L2 Cache
Affinity XE Pro: 256K or 512K L2 Cache
Mylex or AMI PCI RAID Controller
6X SCSI CD-ROM Drive
3.5" 1.44MB Diskette Drive
16-Bit Video
100Base-T PCI Network Adapter
Affinity XE: 4 EISA, 4 PCI Expansion Slots
Affinity XE Pro: 4 EISA, 6 PCI Expansion Slots
Tower Chassis (26"H x 10" W x 25.5"D)
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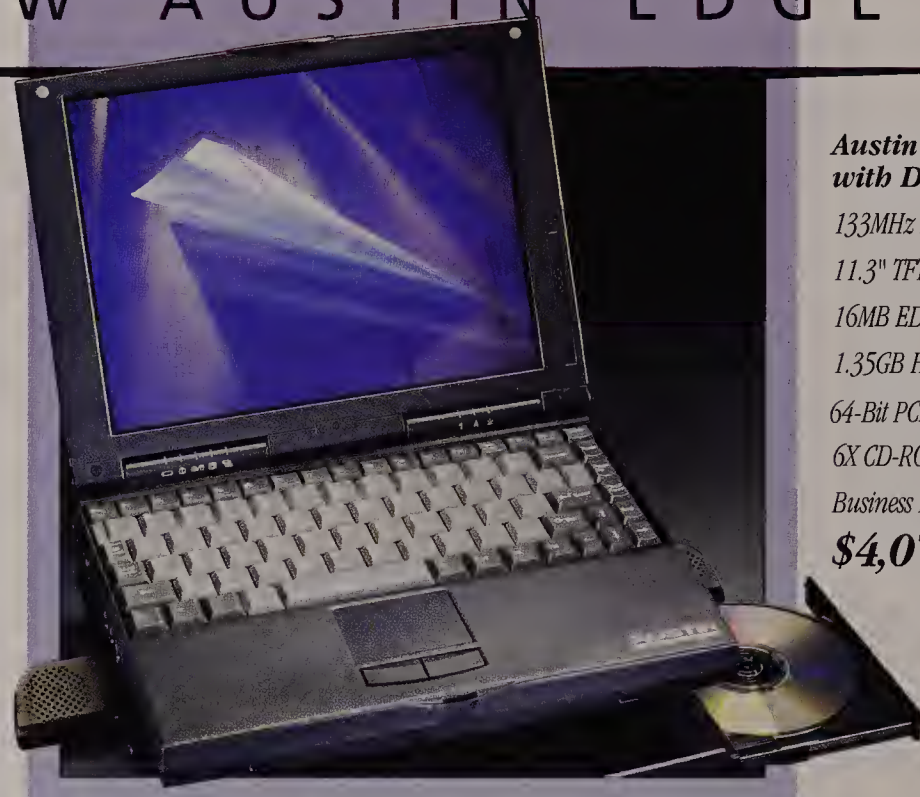

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Integrated Glide Point® Mouse
Base System Weight with Battery: 4.7 lbs.
Win '95 Plug n' Play BIOS and Windows® 95 Pre-Installed

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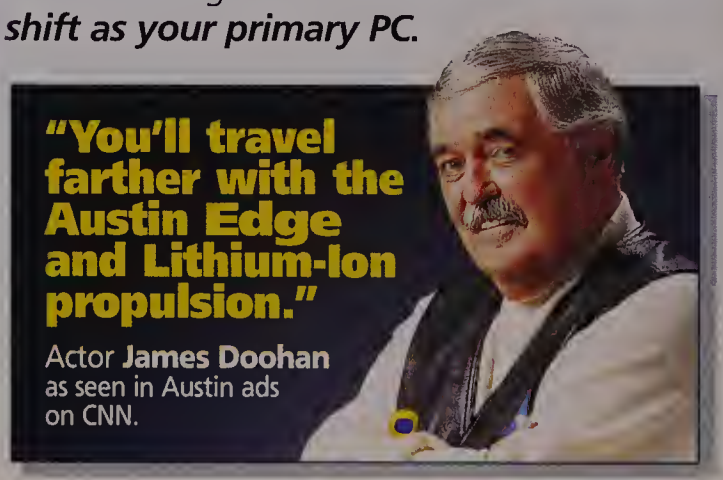

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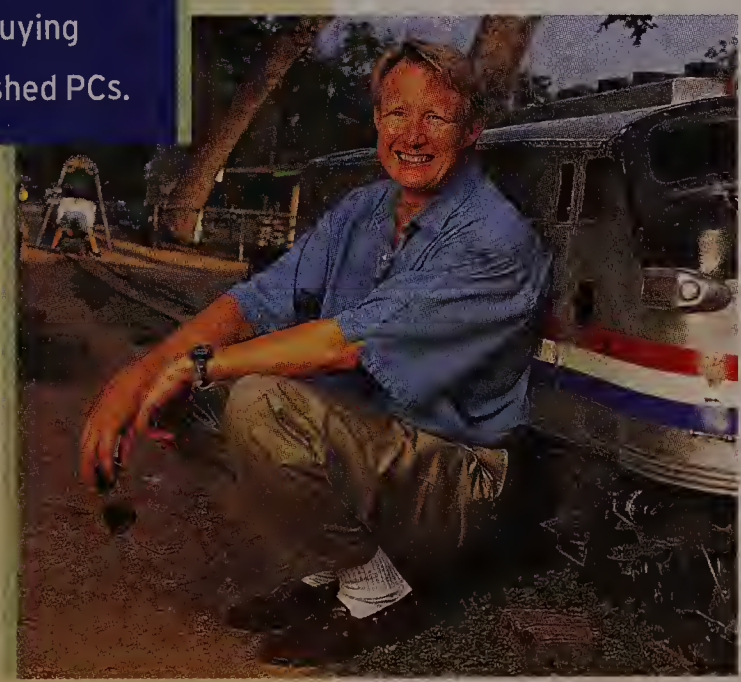
Bargain Hunter's Guide to Buying PCs

Smart ways to save hundreds of dollars on a new–or nearly new–Pentium PC.

ALTON MARTIN KNOWS a bargain when he sees one. An executive vice president at consulting firm Customer Outsourcing Performance Center in Austin, Texas, Martin is always on the lookout for computer hardware that fits his needs—and his budget. "We don't want anything fancy," he says, noting that his company sticks to typical business applications. "We just need good prices."

Good prices are just what Martin gets. His secret? He buys refurbished computers instead of new ones. Martin figures he's saved more than $2000 on the ten refurbished Dell computers he's bought over the past two years—and there's little or no downside to the deal. "We've had no equipment failures, nothing dead on arrival, and no part problems," he says. ▶

Alton Martin saved more than $2000 by buying refurbished PCs.



STEVEN PUMPHREY

BY LAURIANNE MCLAUGHLIN AND BRONWYN FRYER

Buying refurbished equipment is just one crafty way to save big bucks on a computer while you're waiting for the fabled $500 Internet box to arrive. If you don't need a state-of-the-art system, and you're willing to take a risk on used hardware or don't mind trading in your old system, you can save even more money. Even as prices on new Pentium systems continue to plummet, you can still spend less by looking around first.

Of course, buying anything on the cheap involves trade-offs. Systems with slower processors and older components may not be able to run the latest operating systems and applications, limiting your ability to upgrade software. You'll have to spend more time tracking down a good deal and be more flexible about the equipment you're seeking. You also won't get the same warranty protections you get with a new PC, and if things go wrong, you may have to pop the hood and do the troubleshooting yourself. But if you know the tricks and avoid the traps, you can find excellent deals from unusual sources.

THE REFURBISHED ROUTE

WILLING TO LIVE WITH a PC that has a mysterious past? Refurbished PCs are nearly new computers that may have been used briefly and then returned to the manufacturer. They may be victims of buyer's remorse, units returned because of faulty components, or models that have simply been discontinued. In most cases the vendor makes any needed repairs, tests the system rigorously, and then sells it at a substantial discount. To be on the safe side, however, it's a good idea for users to thoroughly test refurbished equipment immediately after it arrives.

Jim Dreyer bought a used 486DX-33 Gateway 2000 system for a dirt-cheap $385.

The popularity of refurbished computers is skyrocketing, and no wonder: Systems from big-name vendors such as Compaq, Dell, Gateway 2000, IBM, Micron, and NEC sell for hundreds of dollars less than regular street prices. Angela Freeman, an editorial researcher in San Francisco, found a great bargain on a fully loaded Micron Millennia P133 through the company's Boise, Idaho, outlet store (208/893-7600). The system, with 16MB of RAM, a 1.6GB hard drive, and a 15-inch monitor, went for just $1750—almost $400 off the price of a new computer system.

"If you know what you want and don't need much hand-holding, buying refurbished is perfect," Freeman says. ▶

Secondhand PCs, First-Rate Prices

Buying a refurbished PC from a factory outlet can save you a little money or a lot, depending on when you shop. Inventory changes by the hour, so don't expect every vendor to offer a refurbished Pentium-166 every day. By the time you read this, prices for the systems listed may have dropped substantially. All these systems come with 16MB of RAM; the Refurbished column lists components and options that differ from new systems'. The Savings column shows how much you can save by buying refurbished instead of new. —Aoife McEvoy

System	Brand-new	Warranty	Street price	Refurbished	Warranty	Street price	Savings
Dell Dimension XPS P166 800/336-2891	2.5GB hard disk; 2MB of VRAM; 8X CD-ROM drive; 17-inch monitor; Windows 95, Office Professional	3 years parts; 1 year on-site	$2581	2GB hard disk; 6X CD-ROM drive; DOS and Windows 3.1; Office Professional not included	90 days parts and labor; no on-site	$2347	$234
Compaq Presario 9660 CDS P166 800/318-6919	2GB hard disk; 6X CD-ROM drive; 28.8-kbps modem; 15-inch monitor; speakers; Windows 95, Quicken	3 years parts and labor; 90 days on-site	$3499	same	90 days parts and labor; no on-site	$2938	$561
Gateway 2000 P5 166 816/545-3700	2.5GB hard disk; 8X CD-ROM drive; 28.8-kbps modem; 17-inch monitor; 16-bit sound card; speakers; Windows 95, Office Professional	3 years parts; 1 year on-site	$2699	2GB hard disk; 6X CD-ROM drive	3 years parts; 1 year labor; 1 year on-site	$2445	$254
Micron Millennia P166 208/893-7600	2.5GB hard disk; 8X CD-ROM drive; 2MB of DRAM; 28.8-kbps modem; 17-inch monitor; speakers; Windows 95; Office Professional, Microsoft Plus	5 years CPU and RAM; 3 years parts; optional 1 year on-site	$2938	2GB hard disk, 6X CD-ROM drive; Microsoft Plus not included	5 years CPU and RAM; 3 years parts; 1 year labor; no on-site	$2725	$213
NEC Ready 9619 P166 800/632-4636	2GB hard disk; 6X CD-ROM drive; 2MB of VRAM; 28.8-kbps modem; 17-inch monitor; sound card; speakers; Windows 95, Works, Publisher, Encarta	3 years parts and labor; 1 year on-site	$3523	same	1 year parts and labor; no on-site	$2698	$825

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Circle 242 on reader service card

She's even happier with Micron's three-year warranty on refurbished PCs—many companies offer only 90-day warranties on such systems, with a 7-day money-back guarantee. "If something does go wrong, my PC has almost the same warranty as the new systems," Freeman says, adding that the only things missing are a money-back guarantee and the one year of free on-site service she'd get with a new Micron.

> Whether you buy refurbished or used, the most important thing to check is the warranty. In most cases, it's going to be short.

Other manufacturers have their own ways of selling refurbished systems. Compaq and Gateway 2000 sell from outlet stores and take phone orders, while IBM sells exclusively by phone. Dell takes phone orders, but many of the best specials in its outlet store in Austin are available on a walk-in basis only. The Compaq Works outlet in Houston, Texas, stocks discontinued items that go for as little as 60 or 70 percent below retail.

The bargains don't stop with complete systems. We found a refurbished Canon BJ-200e personal ink jet printer at the Compaq Works outlet (800/318-6919) for $129—less than half the price of the current BJ-200ex model. You can also find white-elephant deals on older equipment for starving students or your relatives in Minsk: During a promotion over Memorial Day weekend, the store sold 486s for $300 to $1000.

But going the outlet route is not all roses. Warranties vary widely, the selection is limited and unpredictable, and you may spend a lot of time looking for items that may never be in stock.

If a factory outlet doesn't have what you need, look for an independent firm dealing in discontinued and refurbished PCs. Rumarson Technologies (800/929-0029), based in Kenilworth, New Jersey, sells brand-name PCs from manufacturers such as AST, IBM, NEC, and Zenith Data Systems. At press time, Rumarson was selling a new AT&T Globalyst Pentium-133 with 8MB of RAM, a 1.6GB hard drive, a 16-bit sound card, a 28.8-kbps fax-modem, a 6X CD-ROM drive, and a 14-inch monitor for $1704. Comparable new systems cost about $1900.

Micro Exchange (800/284-1200), based in Nutley, New Jersey, sells brand-name, mint-condition (A-grade) Pentium-60 systems complete with monitor for as little as $800. Refurbished (B-grade) computers assembled from brand-name components are even less expensive: $199 for a 486 without monitor. However, the B-grade machines are a little like Frankenstein's monster: The parts may not always get along, and the whole caboodle may lack documentation. A-grade computer systems from Micro Exchange come with warranties ranging from one year to 90 days, depending on the product, while the B-grade systems have a 90-day warranty. All Micro Exchange systems also come with a 7-day money-back guarantee.

USED, NOT ABUSED

IF YOU DON'T MIND a little wear on the key caps, you can save even more with used, brand-name systems returned from leasing programs. Big Blue's leasing arm, IBM Credit Corp. (800/426-5440), sells mostly older PCs—486s, some PS/2 systems, and earlier ThinkPad notebooks—but you can hunt down newer models as well. All systems come with a 90-day warranty and a 7-day money-back guarantee. We found a refurbished IBM 486DX2-66, with 8MB of RAM and a 540MB hard drive, for $780 including monitor.

There's a catch, of course: Most leased equipment has already withstood at minimum one year of heavy use. Conrad Baker, a director of management information systems at Dover Chemical Corp. in Dover, Ohio, is happy with the three previously leased 486-33s he bought for $500 each from IBM Credit. But Baker wouldn't buy such equipment from anyone else. "I felt since they were on IBM's maintenance contract the whole time they were on lease, they'd probably be in good shape," he says.

Whether you buy refurbished or used, the most important thing to check is the warranty. In most cases, it's going to be short. Of the major vendors that we researched for this article, only IBM ▶

C H E C K L I S T

Bargain Hunting Do's and Don'ts

There's treasure galore out there, but where do you start? And once you've found something, how can you tell whether it's today's hot deal or yesterday's leftovers? Here's how you can find the system you want at a great price—and not feel like kicking yourself next week.

- **Do your homework.** Once you've picked out your dream system, contact the manufacturer and dealers for the latest prices and warranty terms. There's no sense in buying a refurbished or used system if it costs only a few dollars less than a new one. To gauge prices, browse current street-price indexes online, postings in Usenet forums such as misc.forsale.computers, and your local newspaper's classified ads.
- **Be flexible.** Identify similar systems you'd be content with if you can't get your first choice. Be clear about what you *don't* want: If you need a Pentium, don't let a sales rep talk you into a 486.
- **Compare apples to apples.** When evaluating systems, be clear about processor speed, installed RAM, hard disk capacity, monitor size and maximum display resolution, multimedia extras (including CD-ROM drive speed), and bundled software. If you're shopping for a laptop, ask whether the display is active-matrix or dual-scan, what type of battery the system uses, and whether a carrying case is included. And don't forget that warranty.
- **Kick the tires.** Whether you're buying a new or refurbished computer, test everything—including peripherals and software you intend to add to it—before the money-back guarantee expires. If you're planning to buy a used system, check it out thoroughly before forking over any money. And whenever possible, buy with a credit card for maximum protection against shoddy merchandise and rip-offs.
- **If you're not sure, wait.** In the computer business, everything will be bigger, faster, and less expensive next month or even next week. When a newer and better system comes out, the computer you almost bought will probably still be around—and will most likely be even cheaper.

—Scott Spanbauer

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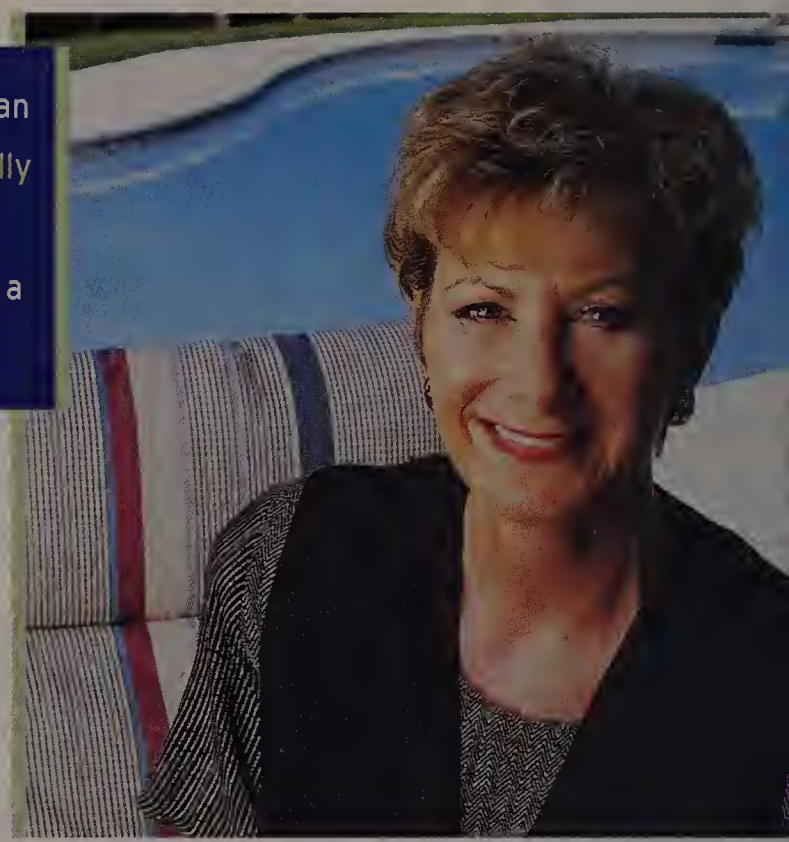
and Micron provide the same warranty on refurbished systems as they do on new ones. (But as noted earlier, Micron does not provide on-site service or a money-back guarantee.) If the computer breaks down outside the warranty period, you'll have to pay for the repairs yourself, and replacement parts may be difficult or impossible to find.

One solution to a short warranty is to purchase a third-party service contract from a local or national dealer. For example, Computerland (408/475-9500) in Capitola, California, sells warranties for $150 to $250 per year, depending on the machine. These contracts cover everything except routine maintenance for users in and around San Jose. Nationally, IBM (800/426-7378) offers premium on-site repair service for Pentium-grade machines of any make or model for around $300 a year.

Even without the safety net of a long warranty, the savings you'll realize on previously owned systems are good enough that even people who've had problems come back for more. Molly Cagle, a State Farm Insurance agent in Baytown, Texas, bought a refurbished Compaq Presario Desktop 972 that turned out to have a bad hard drive. She returned the system within the 90-day warranty period, and the hard drive was replaced. When no other problems developed, she bought a refurbished Aero notebook, too. "Going refurbished is a way to buy a good PC for a lot less than you'd pay retail," Cagle says.

Despite problems with an older PC hard drive, Molly Cagle says buying refurbished systems is a great way to save.



TRICKS OF THE TRADE-IN

IF YOU'RE LOOKING to buy a new computer, chances are you need to unload your old one. As with buying a new car, trading in your old model can shave a few dollars off the price of a new one. Of course, selling it via the local classifieds might net you more money, but it's also a lot more hassle.

Fred Butts of Southlake, Texas, squeezed the last $100 out of his prehistoric IBM XT two years ago by trading it in to Computer Recycle Centers (817/282-1622) in nearby Bedford for credit toward a new system. "I ran a classified ad in the *Fort Worth Star-Telegram* for the whole summer, and nobody would look at it," he recalls.

There are numerous firms that specialize in buying computers in large batches, but it's more difficult to find companies willing to do low-volume deals. Computer Recycle Centers takes used computer systems—even no-name clones and 386s—in virtually any quantity. Larger nationwide firms such as Micro Exchange and Rumarson Technologies accept trade-ins of 10 to 20 systems or more.

But don't think you're going to make big bucks on your old computer systems—most 486s bring in less than $500. "If it's older than five years, the product is pretty much worthless," says Michael Schuler, Micro Exchange's vice president of remarketing. ▶

Web Sites for Savvy Shoppers

The Internet can help you become a smarter shopper. It can also turn you into a sucker. As with any other marketplace, the only way to know a good deal from a rip-off is to do your homework and be cautious with your credit card numbers. Check these sites for great deals on new and used hardware. —Aoife McEvoy

Web site	Description
Anchors Away Corp. http://www.anchors-away.ca	Distributor for used, discontinued, and refurbished systems, notebooks, peripherals, and RAM.
Continental Resources http://www.conres.com	New and used AST, Compaq, HP, IBM, NEC, and Toshiba systems.
Corporate System Center http://www.corpsys.com	New and refurbished hard disks, controllers, CD-ROM drives, and accessories at wholesale prices.
Discount Computer Supplies http://www.webcom.com/~discount	E-mail quotes for hard disks, motherboards, memory, CPUs, sound and video cards, and CD-ROM drives.
eBay AuctionWeb http://www.ebay.com/aw	Trading ground for buyers and sellers of hardware, software, and tons of peripherals.
Oak Park Personal Computers http://www.oppc.com	E-mail quotes for used AST, Compaq, Gateway 2000, IBM, and NEC systems, plus other weekly specials.
Onsale http://www.onsale.com	Live e-mail auction house for desktops, laptops, and peripherals.
Price Watch Computer Index http://www.pricewatch.com	Best street prices available on PC components.
United Computer Exchange http://www.uce.com	Global clearinghouse for buyers and sellers. List your own items for sale, browse the inventory, or make a bid.
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ONLINE BARGAINS AND BEYOND

WHETHER YOU KNOW exactly what you want to buy or you're just window-shopping, the online world is a great place to find used and discounted hardware. You'll find dealer Web pages with the latest prices, Usenet groups filled with real-world advice, and forums on America Online and CompuServe where you can order PCs and components at a significant discount. (For information on other products for sale online, see "Web Sites for Savvy Shoppers.") Most of the companies selling online are small dealers or brokers expanding their existing operations into cyberstorefronts.

Online shopping can uncover discounts of 10 to 50 percent off the price of a new or used PC. In June, Atlanta used-computer brokerage United Computer Exchange (http://www.uce.com) offered an IBM color ThinkPad 755 with 24MB of RAM, an 800MB hard drive, a DX4-100 CPU, and a 28.8-kbps modem for $3000—that's $900 less than the street price for the same system. And Discount Computer Supplies in Erial, New Jersey, offered to build a new Pentium-133 clone with a 1.6GB hard drive, 16MB of RAM, a 6X CD-ROM drive, a 28.8-kbps modem, a 14-inch monitor, and a one-year warranty for $1549. You can find the company online (http://www.webcom.com/~discount).

Price isn't the only benefit to shopping online. You can shop at 3 a.m. on a Sunday if you like, and no pesky salesperson will breathe down your neck. Of course, the same caveats about shopping by mail apply to shopping online. Last May, Jim Dreyer, a self-employed sales representative in Madison, Wisconsin, bought a used 486DX-33 Gateway 2000 system for a dirt-cheap $385. When the system arrived, he found that its CD-ROM drive lacked an adapter, and he also had to pony up $40 for shipping and handling. "The Web page didn't warn me about those charges," he says.

Buying equipment from online sources or private parties can be scary, because there's no guarantee that the products will be reliable. Still, if you really need a certain item, you may find yourself with no other recourse.

Roger Richardson, owner of Delta Sigma Company, a robotics and radar equipment manufacturer in Hesperia, California, says that when he was hunting for a specialty plotter for his business, he had no choice but to look online. "We needed an accurate plotter, and pen plotters are the best for that, but no one makes them anymore," he recalls. "I looked everywhere, and finally found this place on the Internet that had just what I wanted for $1200—one-third the price of the cheapest ink jet plotter—and there's absolutely nothing wrong with it."

If you prefer to make your deals face to face, computer auctions offer overstocked, refurbished, and discontinued equipment at anywhere from 10 to 30 percent below the lowest street price. You can usually find information about upcoming auctions in the business section of your local paper. But auctions aren't for novices. Stay away unless you know exactly what you're buying, and be sure to inspect the merchandise closely before the bidding starts.

If you're willing to scrape the bottom of the barrel, check out computer swap meets, which offer a plethora of items at rock-bottom prices, sold by everyone from reputable store owners to gang members. Here the primary danger is buying faulty or stolen goods. According to Inspector Eric Olsen of the San Francisco Police Department's fencing unit, the willful purchase of stolen merchandise is a felony. Olsen suggests checking any equipment at a swap meet for a serial number, then checking that number against the vendor's—and the swap meet owner's—inventory lists. "If we can prove stuff is stolen, we love to prosecute," he says.

THE ROAD LEASE TRAVELED

IF YOUR CASH FLOW is more like a trickle but your business relies on getting the latest Pentium Pro, leasing is a last, best resort. The benefits are obvious: Instead of plunking down serious cash up front, you pay a monthly fee of about $100 to $300 that you can write off as a business expense. When you no longer need the PC, you send it back. In the long run, though, leasing isn't a money-saving proposition. By the end of the lease's term, you'll have paid nearly the full price of the PC with no assets to show for it.

No matter which route you take, tracking down a bargain PC will pay off. Now what will you do with the money you save on hardware? How about a little software? ■

Laurianne McLaughlin is an associate editor and Bronwyn Fryer a contributing editor for PC World. *Assistant Editor Aoife McEvoy and Contributing Editor Scott Spanbauer contributed to this article.*

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All the Buying News That's Fit

Hidden among the flame wars and occasional misinformation in Internet newsgroups are nuggets of real-world purchasing wisdom—and in some cases, great deals on used computer equipment. Some newsgroups listed here may not be available through your Internet service provider. Check local groups, too, for individuals and dealers near you. We've listed one for the San Francisco Bay Area (ba.market.computers).

- aol.commerce.computers.forsale
- ba.market.computers
- comp.forsale.computers
- misc.forsale.computers
- misc.forsale.computer.pc-clone
- misc.forsale.computer.pc-specific.systems
- misc.forsale.computer.pc-specific.audio
- misc.forsale.computers.pc-specific.cards.misc
- misc.forsale.computers.pc-specific.cards.video
- misc.forsale.computers.pc-specific.misc
- misc.forsale.computers.pc-specific.motherboards
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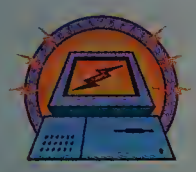
PC WORLD

TOP 100

198 Power Desktops



210 Budget Desktops

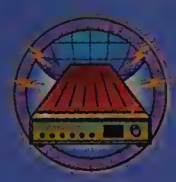
218 Notebooks

233 Printers

237 Monitors

241 Graphics Boards

243 Modems



THE ULTIMATE HARDWARE GUIDE

Pentium-200s, Plus...

TOP OF THE TOP: Dell's new Dimension XPS P200s leaps ahead of 14 other P-200s and tops our Power Desktops chart.

BY BRAD GRIMES

LOOKING FOR the best PC, printer, modem, graphics board, or monitor? Our new Top 100 section brings *PC World*'s monthly Top 20 and Top 10 hardware reviews together under one banner. We'll test and rank the same number of products in all our hardware categories as before, but beginning with this issue we've juggled and repack-

aged the information into a format that's more accessible and easy to use.

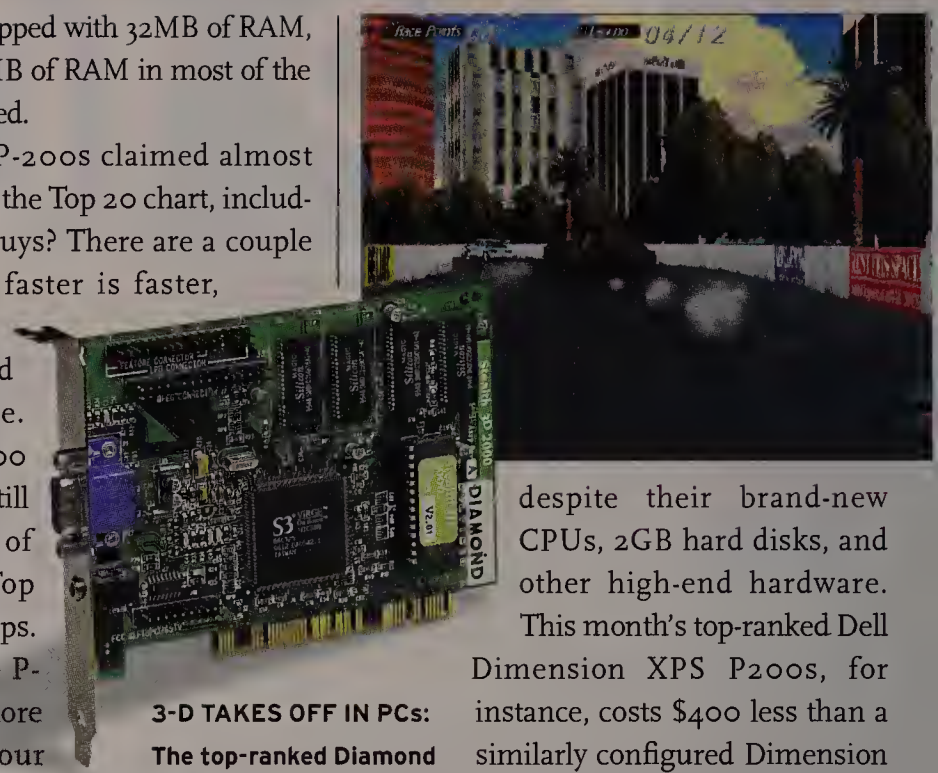
Each month we'll summarize our top picks and the hottest trends, so you'll always have the information you need to buy the best computers and peripherals. For details on the changes we've made, see "Introducing the Top 100." And for a rundown on how you can access these reviews online, see "Make Your Own Top 100."

P-200S ARE GOOD BUYS

THE BIGGEST NEWS in PCs this month is Intel's Pentium-200 chip. We tested 15 new P-200 PCs, 9 of which placed on our Top 20 Power Desktops chart. Three of these—the $3329 Dell Dimension XPS P200s, the $3259 Micron P200 Millennia, and the $4276 Dell OptiPlex GXMT 5200—earned Best Buys.

While the new P-200s are fast, they're not as fast as Pentium Pro-200 systems. In fact, they're not as fast as we thought they'd be. As we expected, the average P-200 machine is faster than the average P-166, but only by about 8 percent—and that's with most of our test PCs equipped with 32MB of RAM, compared to 16MB of RAM in most of the P-166s we've tested.

So why have P-200s claimed almost half the spots on the Top 20 chart, including three Best Buys? There are a couple reasons. First, faster is faster, no matter how small the speed increase may be. The slowest P-200 on the chart is still faster than 13 of last month's Top 20 power desktops. Secondly, these P-200s give you more features for your money than any crop of new systems we've seen.



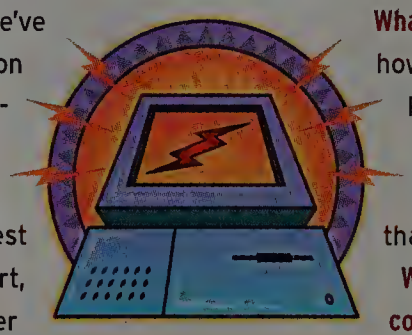
3-D TAKES OFF IN PCs: The top-ranked Diamond Stealth 3D 2000XL brings 3-D effects to some of the latest PCs.

In the past, we've found that prices of new power desktops start out prohibitively high and then become more affordable within a few months. But some of the P-200 machines are priced to move right from the get-go, despite their brand-new CPUs, 2GB hard disks, and other high-end hardware. This month's top-ranked Dell Dimension XPS P200s, for instance, costs $400 less than a similarly configured Dimension XPS P166c did when it first came out. That's because chips and other components are less expensive now. When first introduced, P-166 processors cost $749 each; the P-200 chip costs $599. The prices of big hard drives and memory have dropped, too. The bottom line: These new P-200

INTRODUCING THE TOP 100

THIS MONTH WE'VE IMPROVED the way we present our Top 20 and Top 10 reviews. Almost every change is based on the feedback you've given us through surveys, focus groups, and letters.

We started by making our Top 20 lists easier to read. We've placed scores and features in two separate charts, and we now list features and test results for all Top 20 PCs, not just the new ones. We've also changed the way we present test results. In addition to scoring the speed of a system by giving its PC WorldBench number, we assign it an easy-to-understand word score, ranging from "outstanding" to "poor," to help you get an overall feel for the product. But sometimes test results speak for themselves. In the Top 10 Printers chart, for instance, we present performance results in pages per minute so you can quickly compare them to those of other tested printers as well as to the pages-per-minute rating that vendors supply.



Questions about the charts? The following section should answer most of them. If not, ask us; see page 12 for contact information.

How do the charts work? The Top 20 and Top 10 charts are constantly changing lists of the best PCs, monitors, modems, printers, and graphics boards we've tested. Every month we test the latest products in each category and compare them to the existing pool of products we've reviewed. As new items appear on the charts, those at the bottom drop off.

Where do you get your prices? We estimate street prices based on vendor information and our own research, including surveys of retail outlets. We recheck all prices every month.

What does the overall rating mean? It's the sum of all our tests—both hands-on evaluations and objective benchmark scoring. The scale is 1 to 100, so a product that scores in the 90s is generally considered exceptional, one in the 80s is among the best, one in the 70s is above average, and one that scores lower usually doesn't make it onto the chart.

What does the PC WorldBench score mean? It's a measure of how fast a PC is compared to our baseline machine, a Dell P75t configured with 8MB of RAM, a 540MB hard drive, and no secondary cache. A system that scores 200, for instance, is twice as fast as our baseline unit, while one that scores 82 is 18 percent slower.

Where do the reliability and service and support scores come from? For PCs, the reliability score and the "service" portion of the service and support score come from readers who respond to the Reliability and Service fax-back survey in each issue of *PC World*. The support score is based on the vendor's support policies (length of warranty, available support hours, toll-free lines, and so on). Together they form our service and support score.

What do all those word scores mean? Word scores for performance and price are based on a product's rating in relation to other products in its category. For example, a budget PC that is rated "expensive" is high-priced only in relation to other budget PCs. Likewise, a power notebook rated "good" for performance is good only in comparison to other power notebooks. Word scores for other categories, such as features and design, are relative to all desktops or all notebooks.

PCs give you greater speed and more features at good prices.

Only two new PCs made our Top 20 Budget Desktops chart this month. The seventh-ranked $1695 Blackship P150 CyriMedia 6x86 and the number 15 $2295 Acma zPower 166v are the two fastest budget systems we tested, with PC WorldBench scores of 196 and 199, respectively.

Other fast PCs are becoming good buys, too, as the new Pentiums cause companies to slash prices on older models. Two P-133s jumped from the Power chart to the Budget list this month following price drops of as much as $370. The $2349 Micron P133 Millennia, once a mainstay of the Power chart, earns a budget desktop Best Buy, while the $2352 NEC PowerMate P133 lands at number 12.

MAKE YOUR OWN TOP 100

PC WORLD ONLINE PUTS even more Top 100 information at your fingertips. In addition to write-ups of systems that didn't make the Top 20 lists, you'll find an interactive program that lets you create your own charts. Ever wonder which PC would land at the number one spot of a Top 20 chart if you could apply your own buying criteria? Now you can find out using our Web site's customizer. The customizer uses criteria you choose plus *PC World*'s current data and test results to generate custom-built Top 20 charts for desktops and notebooks. If you have Netscape Navigator 2.0 with Macromedia's Shockwave for Director plug-in, you can use an even cooler version of the customizer that lets you set criteria with sliding scales and drag-and-drop icons. It's easier to use than the normal point-and-click interface.

In coming months we'll add our Top 10 reviews to the customizer so that you can build your own charts for printers, modems, graphics boards, and monitors.

Missed a review? You can find past Top 20s and Top 10s on our Web site. Just go to the headings Current Issue, Hardware, or Mobile Computing, and you can search the last 18 months of *PC World* reviews of systems, monitors, modems, graphics boards, and printers. It's all on PC World Online (http://www.pcworld.com).

WITH NAVIGATOR 2.0 and Shockwave, you can drag and drop your specs.

NOTEBOOKS TAKE SIDES

NOTEBOOK PCS ARE rapidly falling into two separate CPU classes. All the new notebooks in the Top 20 this month are either Pentium-133s or Pentium-100s, and one of each ends up high on the Power Notebooks chart. The $3298 Toshiba Satellite Pro 420CDS P-100 reaps top honors because it's an affordable multimedia portable that performs like a champ and runs for more than 4 hours on a single battery charge. The third-ranked $6299 Toshiba Tecra 720CDT P-133 is the new Rolls-Royce of portable PCs. Its active-matrix screen is a 12.1-inch technological marvel that uses a virtual desktop mode to display programs at 1280-by-1024-pixel resolution.

Other new notebooks to debut on the Power chart are the IBM ThinkPad 760E, the fastest notebook we've tested, and the Austin Edge CD P133, a high-end portable with a relatively low price.

On the Budget Notebooks chart, the Toshiba Satellite 100CS continues its reign in first place. The NEC Versa 550D moves up to the second slot now that Toshiba has discontinued its old DX4-75–based Satellite 2130CS and 2130CT models.

The three new machines on the Budget Notebooks list, the Digital HiNote VP, the AcerNote Light 356, and the Austin Edge XP 100, are powerful portables that each cost less than $2500. You pay less because they don't have a CD-ROM drive or an active-matrix display. Nevertheless, their P-100 processors and 16MB of RAM give them the kind of performance we expect from more expensive notebooks.

THE TOP PERIPHERALS

SEVENTEEN-INCH MONITORS aren't much less expensive than they were a year ago, but today's models are crisper and have more sophisticated controls. As high-speed PCs become cheaper, it's easier to spend an extra $600 or so on a bigger display. Of the 25 different 17-inch monitors we tested in this month's roundup (see "More for the Money: 17-Inch Monitors"), the $899 IBM P70 is the best. Its picture looked great to our judges, the viewable area of its tube is relatively large (15.9-inch diagonal screen size), and it's easy to adjust.

Graphics boards that do a good job of displaying 3-D images are becoming more common. Two of the three new products on this month's Top 10 Graphics Boards chart—the $179 Diamond Stealth 3D 2000XL and the $199 ATI 3D Xpression—are fine boards that combine business and basic 3-D functions at discount prices.

Historically, color printers haven't worked well in black and white; text just isn't as crisp. But the only new entry in this month's Top 10 Printers chart—Xerox's $6500 XPrint 4920 Plus—does a very nice job of combining sharp black text with good color printing. It can't beat HP's $1999 color ink jet, the DeskJet 1600CM, for overall value, but at number two on the color chart, the XPrint is the best color laser workgroup printer we've seen.

We tested eight new modems, but none qualified for the Top 10 Modems chart. The Motorola Lifestyle 28.8 still reigns as our top external modem, and the Zoom V.34C tops the PC Card list. ■

Brad Grimes is an associate editor for PC World. *Editorial Assistant Allyson Bates, Staff Editor John Goddard, Senior Associate Editor Bryan Hastings, Assistant Editor Eric Hellweg, Senior Editor Carla Thornton, and freelance writer Joe Hutsko contributed to the Top 100. Testing for the Top 100 by Dave Casini, Ulrike Diehlmann, Jeff Kuta, Kevin Mitchell, Mike Salayko, and Susan Silvius.* *See page 12 for contact information.*

PC WORLD

TOP 20 POWER DESKTOPS

	Systems	Last month	Last reviewed	Street price (6/15/96)	CPU	Comments
1	Dell Dimension XPS P200s 800/613-3355 www.dell.com	–	new	$3329	Pentium-200	Case and hot graphics card are pluses; fast, but not faster than EDO DRAM systems.
2	Dell OptiPlex GXpro 200 800/613-3355 www.dell.com	1	Aug 96	$4676	Pentium Pro-200	Fastest system to date; modular design; built-in networking; highly reliable.
3	Dell Dimension XPS Pro200n 800/613-3355 www.dell.com	3	Aug 96	$3599	Pentium Pro-200	Well-designed system is fast, but other Pentium Pro-200s are faster.
4	Micron P200 Millennia 800/223-6571 www.micron.com	–	new	$3259	Pentium-200	Performs well for a P-200 with 16MB of RAM; comes with good 3-D graphics card.
5	Dell OptiPlex GXMT 5200 800/613-3355 www.dell.com	–	new	$4276	Pentium-200	Fast P-200 is networkable right out of the box; can't add many PCI cards, though.
6	Gateway 2000 P5-200XL 800/846-2000 www.gw2K.com	–	new	$3899	Pentium-200	Comes with CD-recordable drive, multimedia, modem, lots of software.
7	Micron P166 Millennia Plus 800/223-6571 www.micron.com	7	Mar 96	$3649	Pentium-166	SCSI version of Micron's reputable Millennia line includes Iomega Jaz drive.
8	Quantex QP6/200 SM-2 800/896-4898 www.quantex.com	11	Aug 96	$3149	Pentium Pro-200	Better speed and features than number three Dell, but reliability score is much lower.
9	Quantex QP5/200 SM-2 800/896-4898 www.quantex.com	–	new	$3099	Pentium-200	Inexpensive for a fast, loaded P-200; reliability score hurts.
10	HP Vectra 500 Model 515MCx 5/166 800/752-0900 www.hp.com	6	July 96	$3345	Pentium-166	HP's newest line is good for small and home offices; includes voice mail.
11	ZDS Z-Station GT 500 Series 800/533-0331 www.zds.com	–	new	$3797	Pentium-200	Fast and well put together, except for the add-in cards—they're upside down.
12	HP Vectra VL Series 4 5/200MT 800/752-0900 www.hp.com	–	new	$4122	Pentium-200	Well-configured P-200 is a bit slow for its CPU class; P-166 version is also a good PC.
13	IBM PC 350 P200 800/426-2968 www.ibm.com	–	new	$4835	Pentium-200	Fast PC features new technologies such as universal serial bus, but it's expensive.
14	Maximus Magna Media P-166 800/888-6294 www.maximuspc.com	8	July 96	$2499	Pentium-166	Super price for multimedia P-166; company's reliability, service are unknown.
15	NEC PowerMate P166 800/632-4636 www.nec.com	13	Aug 96	$2999	Pentium-166	Over $250 off this month; quality components, but so-so P-166 performance.
16	Tangent MediaStar 200 800/829-2850 www.tangent.com	–	new	$3195	Pentium-200	Fastest P-200 to date; built-in speakers and video input, but no cool software.
17	Compaq Deskpro XL 5133 800/345-1518 www.compaq.com	15	Mar 96	$3759	Pentium-133	Solid PC, but you pay a premium for built-in SCSI, networking, and EISA slots.
18	Cyrix 6x86-P166+ PC 800/340-7501 www.cyrix.com	19	July 96	$3869	Cx6x86-P166+	$700 price drop; P-166 speed, loaded with software and multimedia hardware.
19	Xi P166MTower SP 800/432-0486 www.win.net/xi_comp	14	Apr 96	$2749	Pentium-166	$250 price drop, nice monitor, fax-modem; reliability and service are unknown.
20	Xi Pro 200 MTower SP 800/432-0486 www.win.net/xi_comp	16	July 96	$4699	Pentium Pro-200	Minitower with SCSI hard drive is fast, but it's expensive even after a $600 price drop.

Best Buy See features chart, page 200; performance chart, page 202. Recommended as home system

[1] To order fax copies of system reviews, call 800/434-4495 from a touch-tone phone and use your credit card. You can order next month's reviews in advance: Power Desktops, Budget Desktops, or Notebook PCs Top 20 charts and capsule reviews ($9.95, available August 28). You can also order a previous month's Top 20 chart with capsule reviews plus features and performance charts ($4.50) and individual capsule reviews with features and performance charts ($1.50 each). Prices effective for the U.S. and Canada. Foreign orders are $15 for advance

USUALLY WHEN A NEW FLEET of PCs hits the market, it takes a while for them to gain a foothold on our Top 20 Power Desktops list. But this month, nine new Pentium-200 systems landed on the chart. Among their cool new features are a CD-recordable drive in the Gateway 2000 P5-200XL and a powerful network maintenance program in the IBM PC 350 P200.

One system that didn't make the Top 20 is the Unisys Aquanta DM P-200. Back to selling consumer PCs after a long hiatus, Unisys has some work ahead. For write-ups of the Aquanta and other PCs that missed the Top 20, check out PC World Online (http://www.pcworld.com/t20pcsnaps).

SCORECARD

Overall rating	PC WorldBench score	Performance	Reliability	Features and design	Price	Service and support	Reader service number	Fax reprint number[1]
88	208	very good	good	outstanding	average	best	679	3415
87	232	outstanding	good	outstanding	very expensive	best	680	3401
86	211	very good	good	very good	average	best	681	3402
85	210	very good	good	outstanding	average	fair	682	3416
85	216	very good	good	very good	expensive	best	683	3417
84	208	very good	fair	outstanding	expensive	good	684	3418
83	198	good	good	outstanding	average	fair	685	3331
82	224	very good	poor	outstanding	average	fair	686	3405
81	216	very good	poor	outstanding	average	fair	687	3419
81	192	good	good	very good	average	fair[2]	688	3383
80	215	very good	fair[2]	outstanding	average	[3]	689	3420
80	201	good	good	very good	expensive	good[2]	690	3421
80	215	very good	fair	very good	very expensive	good	–	3422
79	201	good	[3]	outstanding	inexpensive	[3]	691	3384
78	194	good	fair	very good	average	fair[2]	692	3406
78	220	very good	[3]	outstanding	average	[3]	693	3423
78	173	good	good	very good	average	good	694	3340
77	199	good	[3]	outstanding	expensive	[3]	695	3387
77	199	good	[3]	outstanding	inexpensive	[3]	696	3385
77	221	very good	[3]	outstanding	very expensive	[3]	697	3407
Percentage of overall rating:		Performance 25 percent	Reliability 25 percent	Features 20 percent	Price 15 percent	Support 15 percent		

Top 20s, $8 for previous months' Top 20s, and $4 for individual reviews. [2] Limited data; score is based on responses for this company and average of all companies. [3] Insufficient data.
For more information about all products in this table, circle reader service no. 907.

This Month's Best Buys

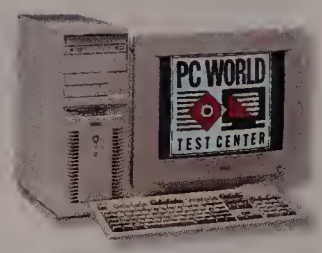
NO. 1: DELL DIMENSION XPS P200S

PROS: Big hard drive, 8X CD-ROM drive, fast graphics card, 28.8-kbps fax-modem

CONS: A bit slower than we expected considering use of fast SDRAM; no speakers

Like most new systems (including several of the P-200s we've tested), the top-ranked $3329 Dell Dimension XPS P200s isn't as fast as we expected. But it's faster than any other Dimension Pentium PC we've seen, and it's particularly well designed.

While the P-200 Dimension has the right overall mix it takes to top our chart, its PC WorldBench score of 208 is bound to go up with future revisions to the system. One place Dell will be looking for an extra boost is in its memory system. The new Intel chip set that Dell includes in its Dimension "s" series supports SDRAM, a faster type of main memory than today's popular EDO DRAM. But in our tests this month, the SDRAM-based Dimension lagged behind several P-200 desktops that use EDO DRAM. As Dell tweaks this PC, we expect its speed to improve.



Dell Dimension P200s

One thing Dell doesn't have to tweak is the graphics card. Our test system features the Number Nine Imagine 128 Series 2 with 4MB of VRAM. While this card added more than $300 to the price of our system, it can handle all your graphics chores, including high-end image editing and desktop publishing. It even has 3-D hardware and support for CAD acceleration. Other notable features include 512K of pipeline-burst cache, a crisp Dell 17-inch monitor, and a U.S. Robotics 28.8-kbps fax-modem.

Dell bundles Microsoft Office Professional with this system, but no speakers to go with the integrated sound chip. A set of standard speakers will cost another $36. Also, make sure you ask Dell to include a Windows 95 CD-ROM if you order. Dell tells us that the standard procedure now is to load Win 95 but not send the CD-ROM unless customers request it.

NO. 2: DELL OPTIPLEX GXPRO 200

PROS: Fastest system we've tested, exceptional design, integrated networking

CONS: Expensive, 4X CD-ROM drive

If you want the fastest PC on the block, the Dell OptiPlex GXpro 200 is for you. With a PC WorldBench score of 232, this Pentium Pro-200 is over 10 percent faster than the fastest P-166 we've tested and 5 percent faster than the fastest P-200. Its high $4676 price buys a built-in 3Com ethernet adapter, lots of RAM, and a Number Nine Imagine 128 Series 2 graphics card with 4MB of VRAM.

Dell OptiPlex

The GXpro doesn't pretend to deliver a supreme multimedia experience—it's ▶

TOP 20 POWER DESKTOPS — STANDARD FEATURES

	Systems	CPU	RAM (MB)	Secondary cache (K)	Hard drive (GB)	Graphics adapter	Video RAM (MB/type)	Monitor tube/ viewable diagonal (inches)	Screen pitch (mm)	CD-ROM drive speed
1	Dell Dimension XPS P200s*	Pentium-200	16	512	2.6	Number Nine Imagine 128 Series 2	4/VRAM	17/15.3	.28	8X
2	Dell OptiPlex GXpro 200*	Pentium Pro-200	32	256	2.1	Number Nine Imagine 128 Series 2	4/VRAM	17/15.6	.28	4X
3	Dell Dimension XPS Pro200n*	Pentium Pro-200	32	256	2.1	Number Nine Imagine 128 Series 2	4/VRAM	17/15.3	.28	8X
4	Micron P200 Millennia*	Pentium-200	16	512	2.6	Diamond Stealth 3D 2000XL	2/EDO DRAM	17/15.9	.26	8X
5	Dell OptiPlex GXMT 5200*	Pentium-200	32	512	1.6	Number Nine Imagine 128 Series 2	4/VRAM	17/15.6	.28	4X
6	Gateway 2000 P5-200XL	Pentium-200	16	512	2.6	Matrox MGA Millennium	2/WRAM	17/15.9	.26	8X
7	Micron P166 Millennia Plus	Pentium-166	16	256	2.2	Diamond Stealth64 Video VRAM	2/VRAM	15/13.6	.28	8X
8	Quantex QP6/200 SM-2	Pentium Pro-200	32	256	2.6	Diamond Stealth64 Video 3200	2/VRAM	17/16.1	.26	6X
9	Quantex QP5/200 SM-2	Pentium-200	32	512	2.6	Number Nine Imagine 128 Series 2	4/VRAM	17/16	.26	8X
10	HP Vectra 500 Model 515MCx 5/166	Pentium-166	16	256	1.6	integrated Trio64	1/DRAM	15/13.7	.28	4X
11	ZDS Z-Station GT 500 Series	Pentium-200	32	256	2.6	integrated ATI-264VT	2/SGRAM	17/15.5	.26	8X
12	HP Vectra VL Series 4 5/200MT	Pentium-200	16	256	1.6	Matrox MGA Millennium	2/WRAM	15/13.5	.28	4X
13	IBM PC 350 P200	Pentium-200	32	512	1.6	integrated Trio64V+	2/EDO DRAM	17/15.5	.28	6X
14	Maximus Magna Media P-166	Pentium-166	16	512	2.1	Matrox MGA Millennium	2/WRAM	15/14	.28	6X
15	NEC PowerMate P166	Pentium-166	16	256	2.1	Matrox MGA Millennium	4/WRAM	15/13.5	.28	6X
16	Tangent MediaStar 200	Pentium-200	32	512	2.1	STB Lightspeed 128	2/MDRAM	17/15.6	.28	6X
17	Compaq Deskpro XL 5133	Pentium-133	16	256	1.1	Compaq QVision	2/VRAM	15/13.6	.28	4X
18	Cyrix 6x86-P166+ PC	Cx6x86-P166+	16	256	4	Matrox MGA Millennium	2/WRAM	17/16	.27	6X
19	Xi P166MTower SP	Pentium-166	16	512	1.3	Matrox MGA Millennium	2/VRAM	17/16	.26	6X
20	Xi Pro 200 MTower SP	Pentium Pro-200	32	256	4.3	Matrox MGA Millennium	4/WRAM	17/15.7	.25	6X

*Best Buy

a fast machine designed to exist in a corporate setting. The 4X CD-ROM drive is slow by today's standards, and the integrated Vibra 16 sound chip and Altec Lansing ACS 31 speakers are fairly plain.

If you want to add better multimedia components later, however, you'll have no problem. The OptiPlex GXpro 200 features a desktop design that is a vast improvement over previous OptiPlex systems. The case is easy to remove, and the layout inside is very modular. Cards are housed on a vertical riser plane that snaps out with the touch of a lever. Even the power supply swings aside for unrivaled access to the motherboard and drive bays. As we would expect from Dell, the new design is clearly explained in the system's manual. It's one of the most easily upgradable systems we've ever seen.

With its combination of speed, features, and top-notch design, the OptiPlex GXpro 200 is a no-brainer Best Buy.

NO. 3: DELL DIMENSION XPS PRO200N

PROS: Big hard drive, powerful graphics card

CONS: Sluggish for a Pentium Pro-200

For a loaded Pentium Pro-200 that's as well built as the Dimension XPS Pro200n, $3599 is a good deal. That covers 32MB of RAM, a big hard drive, an 8X CD-ROM drive, and a Number Nine Imagine 128 Series 2 graphics card with 4MB of VRAM. In addition, Dell bundles Microsoft Office Professional so you can start working immediately.

Dell XPS Pro200n

Its minitower design, which is the same as that of the top-ranked Dimension XPS P200s, is an improvement over previous Dimension designs we've seen. It has a sensibly placed on/off button that can't be mistaken for a floppy eject, and its tidy interior allows for easy upgrading.

The Pentium Pro-200 processor itself is a minor disappointment. The system's PC WorldBench score of 211 is the lowest of all the Pentium Pro-200s we've tested, just 3 points higher than the number one Dimension XPS P200s, which is based on a regular Pentium-200 CPU. Still, the XPS

		EXPANDABILITY						CUSTOMER SUPPORT			
Modem speed (kbps)	Sound board	Case style	Max. RAM (MB)	Maximum secondary cache (K)	Open SIMM sockets	Open drive bays (ext./int.)	Open slots	Warranty for parts/labor (years)	Weekday toll-free support (hours)	Weekend support	Online support
28.8	integrated Vibra 16	minitower	64	512	1	3/1	4	3/3	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
–	integrated Vibra 16	desktop	512	256	3	1/1	4	3/3	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
–	–	minitower	128	512	2	3/1	6	3/3	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
–	Creative Labs Vibra 16	minitower	128	512	2	3/1	5	3/1	24	Sat., Sun.	BBS, WWW
–	integrated Vibra 16	minitower	128	512	2	3/1	5	3/3	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
28.8	Ensoniq Soundscape Vivo	tower	128	512	1	2/6	2	3/3	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
–	Sound Blaster AWE32	minitower	128	256	2	1/1	5	3/1	24	Sat., Sun.	BBS, WWW
28.8	Ensoniq Soundscape Vivo PnP	minitower	128	256	0	2/1	3	1/1	15	Sat., Sun.	BBS, Prodigy, WWW
28.8	Ensoniq Soundscape Vivo	minitower	128	512	0	3/2	4	1/1	15	Sat., Sun.	BBS, Prodigy, WWW
28.8	Sound Blaster 16	minitower	128	256	4	2/1	4	1/1	16	Sat.	AOL, BBS, CIS, WWW
–	Creative Labs Vibra 16	minitower	192	512	4	4/1	5	3/3	24	–	BBS, CIS, MSN, WWW
–	Sound Blaster 16	minitower	128	512	4	2/1	4	3/3	11	–	AOL, BBS, CIS, WWW
–	–	desktop	192	512	4	1/1	5	3/3	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
28.8	Sound Blaster AWE32	minitower	128	512	4	3/2	5	4/4	10	Sat.	BBS, MSN, WWW
–	integrated OPTi 82C930	minitower	128	512	2	2/2	4	3/3	24	Sat., Sun.	AOL, BBS, CIS, MSN, WWW
–	Sound Blaster 32 PnP	desktop	512	512	6	1/1	6	3/3	11	Sat.	BBS, WWW
–	integrated 16-bit	desktop	144	256	4	1/0	4	3/3	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
28.8	Sound Blaster AWE32	minitower	128	512	2	1/0	3	3/3	24	Sat., Sun.	BBS, WWW
28.8	Sound Blaster AWE32	tower	128	512	4	5/2	7	3/3	9	Sat.	WWW
28.8	Sound Blaster AWE32	minitower	512	256	2	5/1	2	3/3	9	Sat.	WWW

Pro200n delivers lots of speed and features, and now Dell builds a three-year warranty into the price of all Dimensions. You can save $199 by buying only a one-year warranty, but you have to ask for it.

NO. 4: MICRON P200 MILLENNIA

PROS: 8X CD-ROM drive, 3-D graphics card

CONS: No modem

Like all Micron Millennia systems we've tested, the $3259 P200 Millennia is a solid power desktop. Its sturdy design and ample configuration place it among the best new P-200s. A PC WorldBench score of 210 puts it in the middle of the Pentium-200 pack, but of the P-200s we've tested that come with 16MB of RAM, it's among the fastest.

Its large secondary cache and roomy hard drive are nice, but nothing we haven't seen from several other vendors. What's unique in our test system is the Diamond Stealth 3D 2000 graphics card. The P200 Millennia is the first PC we've seen to use this card, which combines exceptional Windows graphics performance with 3-D acceleration (see this month's Top 10 Graphics Boards). It has more 3-D features than the Matrox MGA Millennium board and is nearly as fast. It's economical for people who want to use 3-D in presentations, Web sites, CAD programs, and games.

Micron P200 Millennia

The rest of the P200 Millennia is a study in attention to detail. Its 17-inch Micron monitor is easy on the eyes; its Advent speakers are easy on the ears. The minitower case is narrower and taller than most we've seen, but still easy to upgrade. In back, all the multimedia ports are on a single small panel near the top of the PC, making them easily accessible. And there's an extra fan to keep the insides cool.

We've also tested a P166 Millennia with 16MB of RAM, a 1.6GB hard drive, and a 15-inch monitor. It costs about $700 less than the P200 Millennia yet runs only 5 percent slower. For power users looking to spend less, it's a great buy. In addition to offering round-the-clock support and a long warranty, Micron bundles Microsoft Office Professional. ▶

NO. 5: DELL OPTIPLEX GXMT 5200

PROS: Fast, built-in networking, hot graphics card

CONS: Expensive, quad-speed CD-ROM drive

The Pentium-200 version of Dell's network-ready OptiPlex GXMT line is built for speed. With a PC WorldBench score of 216, it's the third-fastest P-200 system we've tested. While its less expensive siblings—the $3877 GXMT 5166 and $2813 GXMT 5133—are also good buys, the $4276 OptiPlex GXMT 5200 has the extra horsepower to leapfrog the others and earn a Best Buy.

Our test system's speed is due in no small part to its 32MB of RAM and 512K of secondary cache. Even its Imagine 128 Series 2 graphics board keeps data moving rapidly. The only thing in the PC that's slow is the quad-speed CD-ROM drive. It can handle today's multimedia, but you'll want to upgrade soon.

Dell OptiPlex

Inside, the 3Com ethernet adapter and 16-bit sound chip are integrated onto the motherboard so they don't take up room. The add-in card slots hover above the motherboard on a daughtercard so you don't have to worry about system chips hindering longer boards. ▶

TOP 20 POWER DESKTOPS — PERFORMANCE

	Systems	CPU	RAM (MB)	Secondary cache (K)	PC WorldBench score
1	Dell Dimension XPS P200s*	Pentium-200	16	512	208
2	Dell OptiPlex GXpro 200*	Pentium Pro-200	32	256	232
3	Dell Dimension XPS Pro200n*	Pentium Pro-200	32	256	211
4	Micron P200 Millennia*	Pentium-200	16	512	210
5	Dell OptiPlex GXMT 5200*	Pentium-200	32	512	216
6	Gateway 2000 P5-200XL	Pentium-200	16	512	208
7	Micron P166 Millennia Plus	Pentium-166	16	256	198
8	Quantex QP6/200 SM-2	Pentium Pro-200	32	256	224
9	Quantex QP5/200 SM-2	Pentium-200	32	512	216
10	HP Vectra 500 Model 515MCx 5/166	Pentium-166	16	256	192
11	ZDS Z-Station GT 500 Series	Pentium-200	32	256	215
12	HP Vectra VL Series 4 5/200MT	Pentium-200	16	256	201
13	IBM PC 350 P200	Pentium-200	32	512	215
14	Maximus Magna Media P-166	Pentium-166	16	512	201
15	NEC PowerMate P166	Pentium-166	16	256	194
16	Tangent MediaStar 200	Pentium-200	32	512	220
17	Compaq DeskPro XL 5133	Pentium-133	16	256	173
18	Cyrix 6x86-P166+ PC	Cx6x86-P166+	16	256	199
19	Xi P166MTower SP	Pentium-166	16	512	199
20	Xi Pro 200 MTower SP	Pentium Pro-200	32	256	221

*Best Buy

Word 7.0 for Windows 95 · Excel 7.0 for Windows 95 · Picture Publisher 6.0 for Windows 95 · Paradox 5.0 for Windows · WordPerfect 6.1 for Windows · 1-2-3 release 5 for Windows

HOW WE TEST A higher PC WorldBench score is better. All systems are tested with PC WorldBench, PC World's application-based benchmark. All PCs have Windows 95, and video resolution is set to 800 by 600 in 256 colors. We run automated scripts on six popular business applications, performing common tasks such as spelling checks, scrolls, saves, sorts, and recalculations. The PC WorldBench score is a sum of the weighted result of each script: Word (25 percent), Excel (20 percent), Picture Publisher (15 percent), Paradox (15 percent), WordPerfect (15 percent), and 1-2-3 (10 percent). For more details on our benchmark and how we run it, see PC World Online (http://www.pcworld.com).

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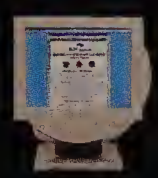

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New This Month

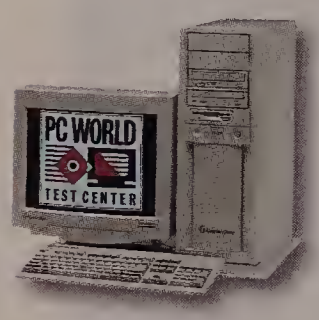
The following PCs made our Power Desktops chart for the first time this month. For previously tested PCs on the chart, visit our Web page at http://www.pcworld.com/t20pcs.

NO. 6: GATEWAY 2000 P5-200XL

PROS: 8X CD-ROM drive, CD-recordable drive, 28.8-kbps fax-modem

CONS: A bit slower than we expected considering use of fast SDRAM

Gateway 2000 has a reputation for being on the cutting edge, and its first P-200, the $3899 P5-200XL, has an especially unique feature. We're not talking about its new, faster SDRAM, which failed to boost performance significantly. What really catches our eye is its recordable CD-ROM drive, which you can use to create your own multimedia CD-ROMs or even a disc of favorite songs.



Gateway 2000

The system's 17-inch Vivitron monitor displays crisp graphics and is fed by a 2MB Matrox graphics card. For multimedia aficionados, the PC comes with a fast CD-ROM drive, an Ensoniq Vivo wavetable sound card, and a set of Altec Lansing ACS400 speakers with a subwoofer.

NO. 9: QUANTEX QP5/200 SM-2

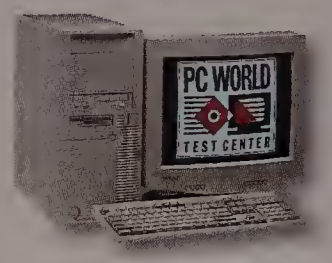
PROS: 8X CD-ROM drive, voice-capable modem

CONS: Poor reliability score

Quantex's SM-2 line of PCs is well suited for office or home, and the new $3099 QP5/200 SM-2 is no exception. It's among the fastest P-200s we tested this month, but it's only 3 percent faster than the $2899 QP5/166 with the same amount of RAM and secondary cache.

The QP5/200 comes with all the multimedia extras befitting a fast PC. The 17-inch MAG InnoVision DX1795 monitor has a great screen. You shouldn't have to upgrade the Imagine 128 Series 2 graphics card, with its 4MB of VRAM and 3-D acceleration, for years to come. The speedy Toshiba 8X CD-ROM drive should make working with text-heavy titles a pleasure. The PC's Ensoniq Soundscape Vivo wavetable sound card capably powers a three-piece Altec Lansing ACS31 sound system with subwoofer. To top it off, Quantex throws in a Supra 28.8-kbps fax-modem with telephony features.

The company bundles several CD-ROMs, including Grolier's Multimedia Encyclopedia and two entertainment titles—Al Unser Jr. Arcade Racing and USS Ticonderoga, a submarine adventure game. For business as usual, bundled applications include the PerfectOffice application suite, Quicken, and GoldDisk Astound, for producing multimedia presentations.



Quantex

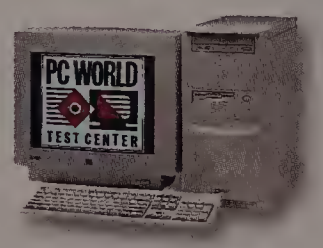
The roomy minitower case is bulky, but it has a sculpted, easy-access front panel and a spacious, uncluttered interior that's easy to navigate. That's a good thing, because getting through to technical support can be tough. The company says it has added support personnel, but we're still encountering unacceptably long hold times. As for system reliability, its score is still low, but we've recently seen an increase in respondents' satisfaction and a decrease in DOA reports.

NO. 11: ZDS Z-STATION GT 500 SERIES

PROS: Fast, well designed, 8X CD-ROM drive

CONS: Add-in cards hard to reach

If the Micron P200 Millennia is the Bud Abbott of minitower PCs—tall and thin—the $3797 ZDS Z-Station GT 500 Series is the Lou Costello. But we doubt the comic actor ever ran as fast as this stout, rounded Pentium-200 system. Its PC WorldBench score of 215 places it among the fastest P-200s we've tested. The reason: 32MB of EDO RAM. Although it's hard to compare the Z-Station's performance against that of other P-200s with 16MB of memory, one thing is clear: If you want more speed, add memory, not just secondary cache. With 32MB of memory and 256K of cache, the Z-Station outstrips systems such as the Dell Dimension XPS P200s, which has 16MB of fast SDRAM and 512K of secondary cache.



ZDS Z-Station

Inside, the Z-Station sports unique graphics components. Its integrated controller is the same chip ATI uses on its Video Xpression board, but instead of EDO DRAM, it uses 2MB of SGRAM to increase the amount of data it can pipe. On the business end of the graphics system is a reasonably good 17-inch ZDS monitor with a fine .26mm dot pitch for crisp images.

For the most part, we like the Z-Station's design. The case is sturdy and attractive. Unfortunately, working with PCI and ISA cards is a pain. ZDS uses a riser plane for add-in cards. However, in the Z-Station minitower the riser plane is facedown, which means the cards hang upside down. Unless you want to turn troubleshooting or card swapping into a gymnastics event, you'll have to turn the minitower on its side.

ZDS bundles a few useful applications with the Z-Station, including Netscape Navigator, Norton Navigator (for managing files), and Norton Antivirus, but no big software suites. Our file on ZDS's reliability isn't big enough for us to give it a formal rating, but the readers we've heard from find ZDS systems very reliable. The company backs its corporate PCs with a three-year warranty and round-the-clock support on weekdays.

NO. 12: HP VECTRA VL SERIES 4 5/200MT

PROS: Good graphics card, crisp monitor

CONS: Expensive, sluggish for a P-200

The Vectra VL Series 4 5/200MT is only slightly faster than its $3915 Pentium-166 sibling. But all other things being equal, the added speed is enough to make it Hewlett-Packard's best high-end corporate PC. To get this quality, though, you have to be willing to pay—$4115, to be exact. The money gets you a well-designed minitower from a vendor that's known for reliable PCs.

The exterior is unremarkable, but the case is sturdy and easy to open. Add-in cards sit parallel to the motherboard ▶

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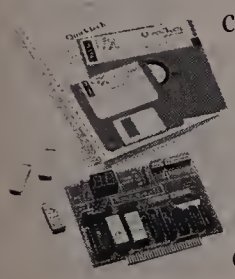

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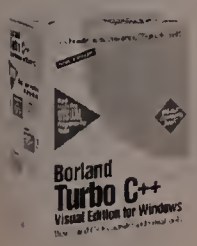

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on a riser so you can fit any size board you want. Our test PC had room for four extra cards and three extra storage devices.

Graphics hardware is one of this PC's strongest suits. A Matrox MGA Millennium graphics card with 2MB of WRAM and an MPEG daughtercard connector drives a sharp, bright 15-inch HP monitor. The system also comes with a Sound Blaster 16 audio card, but unfortunately speakers are an extra-cost option. While the 4X CD-ROM drive in our test system is adequate for today's multimedia titles, most power desktop vendors are shipping faster drives in anticipation of future applications.

HP Vectra

While HP installs some helpful software tools for getting to know your PC, it includes no application software. It backs Vectra VL systems with a three-year warranty, but free technical support is available for only one year and for just 11 hours on weekdays.

NO. 13: IBM PC 350 P200

PROS: Fast, well designed, cutting-edge extras

CONS: Ugly, expensive, low reliability score

On the outside the $4122 IBM PC 350 P200 desktop PC looks half-finished, with its drive bays recessed inches from the rest of the front panel. But this P-200 is fast, comes with a good software bundle, and includes some nice power-saving and automation features. However, you pay extra for Big Blue's attention to detail.

The system's ugly exterior serves a purpose by protecting the power buttons and drive bays. It also gives shape to an interior design that's far more elegant than what's on the surface. Inside you'll find a tidy motherboard that's simple to upgrade. Extra slots are available on a vertical riser, which makes adding cards easy because motherboard components won't block longer cards. Adding a lot of RAM is an option, too—but upgrading the CPU is another story. It's stashed under the hard drive, rendering it virtually untouchable.

IBM PC 350

The PC 350 P200 comes with built-in universal serial bus ports for chaining several peripherals together, an extra serial port for connecting an infrared transmitter, and a spare drive bay designed for PC Card slots (the PC Card bay is sold separately). Other nice extras include a suspend and resume feature and a "wake on demand" program that tells your system to power up at a certain time or in response to a specific event, like a call through your modem.

The PC 350 P200 is one of the fastest Pentium-200s we've tested. Its PC WorldBench score of 215 is partly due to IBM's wise choice of an integrated graphics chip. Rather than hurt performance by using inferior chips, IBM uses a speedy Trio64V+ graphics chip with 2MB of EDO DRAM to keep data moving to the monitor, an impressive IBM G70 17-inch model in this instance.

PC 350 P200 systems come with Lotus SmartSuite as well as a program called NetFinity that helps network administrators manage networked PCs remotely. The software even lets them turn on workers' systems from a central location in order to perform maintenance. IBM's support, which includes an extensive three-year warranty, has been highly rated in past years. Recently, however, readers responding to our fax-back survey have said they're less satisfied than they used to be with IBM's system reliability and service.

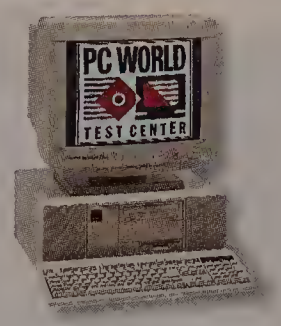
NO. 16: TANGENT MEDIASTAR 200

PROS: Good price for a P-200, unique design, built-in speakers, super graphics card

CONS: No multimedia titles to show off cool features, design could be a liability

If you have multimedia on your mind, Tangent's speedy, souped-up MediaStar 200 will be music to your ears. Featuring a striking desktop chassis with built-in stereo speakers, front-mounted video-in and -out jacks, and a dual-purpose MIDI/game port, the $3195 MediaStar begs to be played with. This isn't to say it's not a serious machine—it handles business applications with unprecedented power. By posting a PC WorldBench score of 220, the MediaStar takes its place as the fastest Pentium-200 system we've seen to date, faster than than the Dell Dimension XPS Pro200n. The motherboard even has an extra CPU socket if you want to add a second processor.

The MediaStar is the first PC we've tested to include STB's new Lightspeed 128 graphics card with 2MB of Multibank DRAM. The MDRAM pumps more data than standard DRAM or VRAM in order to keep up with the faster 128-bit graphics chip. The fact that it can do so with just 2MB helps keep costs down. The board is a nice match for the sharp 17-inch Sampo AlphaScan 17mx monitor.



Tangent MediaStar

The system's case design is unusual: It places controls and ports on the front panel rather than in back. At your fingertips are not only the power button but controls for speaker power, volume, and bass boost, as well as the multimedia ports. Having connectors up front will appeal to some, but others might prefer them in back and out of the way.

Tangent backs the MediaStar 200 with a three-year warranty and toll-free support 11 hours a day on weekdays and Saturdays. But our spot calls to technical support have yielded disappointing results, and we don't have enough reader feedback to formally rate the company's system reliability and service. ▶

Beyond the Top 20

We tested these systems along with the others, but they didn't score high enough to reach the Top 20 Power Desktops chart. For write-ups, see PC World Online (http://www.pcworld.com/t20pcsnaps).

- **Austin PowerPlus 200**
- **Canon MT 9600 P-166**
- **DFI LandMarq Pro P166+ IPC**
- **DirectWave Blue Thunder P200 MVP ProS**
- **MultiWave UltraStar P200**
- **Unisys Aquanta DL P-166**
- **Unisys Aquanta DM P-200**
- **Vektron Optima Pro Station P200**

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If you need a scanner that combines high performance and maximum value, may we suggest a little head-to-head competition. UMAX vs HP? Unfair comparison? Maybe for them. UMAX has a reputation for offering advanced, award-winning scanners at prices that make good business sense. Plus, our software bundles are unmatched, even by the big boys. So why monkey around? Compare the UMAX Vista S-12 with the HP ScanJet 4c and decide for yourself.

Compare	UMAX Vista S-12	HP Scanjet 4c
Image editor software	✔ Adobe Photoshop Full	Photopaint
Presentation software	✔ ASAP Word Power	None
Maximum DPI	✔ 9600	2400
Bit depth	✔ 33-bit[1]	30-bit
Scanning speed (5" x 7" color photo)	✔ 18 sec.	42 sec.
Lamp	✔ Cold cathode - lasts longer	Fluorescent
Tech support	✔ Toll free	No 800 number
Price [2]	✔ $821	$ 912

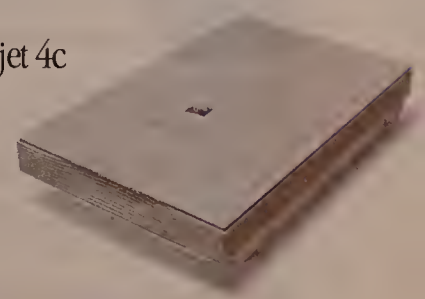
UMAX Vista S-12

UMAX

toll free **800-859-2728**

http://www.umax.com

HP Scanjet 4c



Circle 250 on reader service card

[1] 33-bit equivalent with the analog gamma correction. [2] Average street price from sampled advertisements in Computer Shopper May, 1996.

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PC WORLD

TOP 20 BUDGET DESKTOPS

	Systems	Last month	Last reviewed	Street price (6/15/96)	CPU	Comments
1	Dell Dimension P100t 800/613-3355 www.dell.com	1	July 96	$1629	Pentium-100	Entry-level PC offers quality and speed, $220 price drop; no speakers.
2	Dell OptiPlex GXM 5100 800/613-3355 www.dell.com	2	Aug 96	$2223	Pentium-100	Good for those who want a well-made budget PC with built-in networking.
3	Gateway 2000 P5-120 800/846-2000 www.gw2K.com	3	Mar 96	$1809	Pentium-120	$170 off solidifies standing in Best Buy ranks; no sound or speakers.
4	Micron P133 Millennia 800/223-6571 www.micron.com	–	Mar 96	$2349	Pentium-133	$300 off makes it a budget PC; P-100, -120, -150, and -166 flavors are also good.
5	Quantex QP5/100 M-3 800/896-4898 www.quantex.com	5	Mar 96	$1799	Pentium-100	Great value, upgraded tech support; reliability score is a problem.
6	Compaq Prolinea 575e 800/345-1518 www.compaq.com	16	May 96	$1549	Pentium-75	Solid budget system from a reputable vendor; no CD-ROM drive.
7	Blackship P150 CyriMedia 6x86 800/531-7447 www.blackship-computers.com	–	new	$1695	Cx6x86-P150+	Performs like a P-166 and comes with lots of stuff; pretty bland.
8	Compaq Prolinea 5120 800/345-1518 www.compaq.com	–	Mar 96	$2448	Pentium-120	A good office machine, but you pay a lot for what you get; no CD-ROM drive.
9	Micro Express MicroFlex-686/P120+ 800/989-9900 www.wpages.com/microexpress/	7	Aug 96	$1399	Cx6x86-P120+	Dirt-cheap PC with P-120-type power, but getting support can be difficult.
10	NEC PowerMate V100 800/632-4636 www.nec.com	17	Aug 96	$2304	Pentium-100	Solid value system with nice design features, but graphics system is weak.
11	USA Flex Family Special 800/872-3539 www.usaflex.com	–	July 96	$2149	Pentium-133	$250 price drop lands it on chart; sparse documentation.
12	NEC PowerMate P133 800/632-4636 www.nec.com	–	Mar 96	$2352	Pentium-133	$370 off lands this powerful PC on the Budget chart; fast, quality components.
13	Xi P133MTower SP 800/432-0486 www.win.net/xi_comp	13	Mar 96	$2099	Pentium-133	Great performance, $150 price drop, very expandable; tech support is limited.
14	Tempest Micro MediaPro P5-133 800/818-5163	–	Mar 96	$1798	Pentium-133	Decked-out PC outruns most budget systems; reliability, service are unknown.
15	Acma zPower 166v 800/786-6888 www.acma.com	–	new	$2295	Pentium-166	Fast multimedia system is great deal and includes PC Card slots.
16	Netis N5100 Media 800/577-7526 www.netistech.com	–	May 96	$1730	Pentium-100	Fast for a P-100; documentation is haphazard, reliability is unknown.
17	Vektron Multimedia P-100 800/725-0026 www.vektron.com	4	Mar 96	$1895	Pentium-100	Monitor and hard drive upgrades have raised price $200 on this loaded PC.
18	Micro Express MicroFlex PCI/5133 800/989-9900 www.wpages.com/microexpress/	12	Apr 96	$1799	Pentium-133	Fast, low-cost P-133; early returns indicate below-average reliability.
19	HiQ Saturn Station 800/827-5836 www.hiq.com	–	June 96	$1999	Pentium-166	Low price for a multimedia P-166; reliability and service are unknown.
20	Robotech Cobra XLT P-133 800/255-2215 www.robotechusa.com	8	July 96	$2099	Pentium-133	Fast, affordable PC for the home office, but documentation is spotty.

Best Buy See features chart, page 212; performance chart, page 214. Recommended as home system.

[1] To order fax copies of system reviews, call 800/434-4495 from a touch-tone phone and use your credit card. You can order next month's reviews in advance: Power Desktops, Budget Desktops, or Notebook PCs Top 20 charts and capsule reviews ($9.95, available August 28). You can also order a previous month's Top 20 chart with capsule reviews plus features and performance charts ($4.50) and individual capsule reviews with features and performance charts ($1.50 each). Prices effective for the U.S. and Canada. Foreign orders are $15 for advance

THE RECENT INTRODUCTION of Intel's P-200 processor brought a rash of price cuts across older PC lines. Gateway 2000, Micron, and NEC are among the vendors to slash prices on budget machines. In particular, the Micron P133 Millennia debuts on the Top 20 Budget Desktops chart this month following a price cut that knocked it below $2500, our budget ceiling.

Only two new systems appear on the chart this month: the $1695 Blackship P150 CyriMedia 6x86 and the $2295 Acma zPower 166v. A couple of powerful PCs just missed the Top 20, though. See write-ups of Caliber's P-200 and Micro Express's Pentium Pro-200 on PC World Online (http://www.pcworld.com/t20pcsnaps).

SCORECARD

Overall rating	PC WorldBench score	Performance	Reliability	Features and design	Price	Service and support	Reader service number	Fax reprint number[1]
90	173	good	good	very good	inexpensive	best	698	3391
84	170	good	good	very good	average	best	699	3409
83	176	good	fair	very good	average	good	700	3392
82	182	very good	good	outstanding	expensive	fair	701	3268
80	167	good	poor	outstanding	average	fair	702	3353
78	86	poor	good	satisfactory	inexpensive	good	703	3366
77	196	very good	[2]	good	inexpensive	[2]	704	3424
77	169	good	good	good	expensive	good	705	3425
76	175	good	[2]	good	very inexpensive	[2]	706	3411
76	163	good	fair	very good	expensive	fair[3]	707	3413
76	181	very good	[2]	very good	average	[2]	708	3426
76	185	very good	fair	very good	expensive	fair[3]	709	3427
76	193	very good	[2]	very good	average	[2]	710	3398
76	183	very good	[2]	very good	average	[2]	711	3428
76	199	very good	[2]	outstanding	expensive	[2]	712	3429
75	166	good	[2]	very good	inexpensive	[2]	713	3367
75	171	good	[2]	very good	average	[2]	714	3325
75	190	very good	[2]	very good	average	[2]	715	3361
75	190	very good	[2]	very good	average	[2]	716	3379
75	189	very good	[2]	outstanding	average	[2]	717	3393
Percentage of overall rating:		Performance 15 percent	Reliability 25 percent	Features 20 percent	Price 25 percent	Support 15 percent		

Top 20s, $8 for previous months' Top 20s, and $4 for individual reviews. [2] Insufficient data. [3] Limited data; score is based on responses for this company and average of all companies.
For more information about all products in this table, circle reader service no. 908.

This Month's Best Buys

NO. 1: DELL DIMENSION P100T

PROS: Fast P-100, inexpensive, highly upgradable

CONS: No speakers, no AVI acceleration

The Dell Dimension P100t desktop is fast, easy to upgrade, and $220 cheaper than last month. For $1629 you get a P-100 with 16MB of RAM and a 1.6GB hard drive. With a PC WorldBench score of 173, the P100t delivers some of the best performance for the money of any PC we've seen. It's the second-fastest P-100 we've tested, and it's faster than several P-133s.

However, it's not a full multimedia PC. Although it comes with a 6X CD-ROM drive and a 16-bit sound card, speakers are optional; and despite the fact it has 2MB of graphics memory, its integrated S3 Trio64 graphics chip lacks features for speeding up full-motion video clips. Consider spending an extra $250 for some basic speakers and a 2MB video-enabled board. Even with a slightly higher price, the Dimension P100t would rank at the top of our Budget chart.

Dell Dimension P100t

NO. 2: DELL OPTIPLEX GXM 5100

PROS: Speedy, well designed, built-in networking

CONS: No application software

The $2223 OptiPlex GXM 5100 is aimed at the business PC buyer who wants the built-in networking features of an OptiPlex but doesn't have a lot to spend. Its performance is nothing to sneeze at, either—a PC WorldBench score of 170 puts it among the fastest Pentium-100s we've tested.

The graphics and 16-bit sound controllers are integrated on the motherboard, but unlike other entry-level Dell PCs, including the top-ranked Dimension P100t, this OptiPlex has a graphics chip that accelerates full-motion video.

Dell OptiPlex

The documentation is detailed, thorough, and user-friendly. About the only thing lacking from the package is some application software.

NO. 3: GATEWAY 2000 P5-120

PROS: Good performance, 8X CD-ROM drive, Microsoft Office Professional Edition

CONS: No sound, speakers, or modem

Gateway keeps dropping the price of its P5-120. This month another $170 comes off, keeping this sturdy minitower system among the best budget PCs we've seen. But while $1809 is a great deal for a P-120, it doesn't include several components that are becoming standard in today's desktops. You'll need to pay another $100 for a sound card and speakers if you want full multimedia. And if you want to surf the Web, a 28.8-kbps fax-modem costs another $149.

The P5-120's PC WorldBench score ▶

TOP 20 BUDGET DESKTOPS — STANDARD FEATURES

	Systems	CPU	RAM (MB)	Secondary cache (K)	Hard drive (GB)	Graphics adapter	Video RAM (MB/type)	Monitor tube/ viewable diagonal (inches)	Screen pitch (mm)	CD-ROM drive speed
1	Dell Dimension P100t*	Pentium-100	16	256	1.6	integrated Trio64	2/DRAM	15/13.6	.28	6X
2	Dell OptiPlex GXM 5100*	Pentium-100	16	256	1.1	integrated Trio64V+	2/EDO DRAM	15/13.5	.28	4X
3	Gateway 2000 P5-120*	Pentium-120	16	256	1.6	ATI Mach 64	2/DRAM	15/14	.26	8X
4	Micron P133 Millennia*	Pentium-133	16	256	1.6	Diamond Stealth64 Video VRAM	2/VRAM	15/13.6	.28	8X
5	Quantex QP5/100 M-3*	Pentium-100	16	256	1.6	STB Powergraph 64 Video	2/EDO DRAM	15/14	.28	8X
6	Compaq Prolinea 575e	Pentium-75	8	–	0.6	integrated Cirrus Logic	1/DRAM	15/13.6	.28	–
7	Blackship P150 CyriMedia 6x86	Cx6x86-P150+	16	512	1.3	Matrox MGA Millennium	2/WRAM	15/13.5	.28	6X
8	Compaq Prolinea 5120	Pentium-120	16	256	1.1	integrated Cirrus Logic	1/DRAM	17/15.8	.28	–
9	Micro Express MicroFlex-686/P120+	Cx6x86-P120+	16	256	1.3	STB Powergraph 64 Video	2/DRAM	15/14.1	.28	4X
10	NEC PowerMate V100	Pentium-100	16	256	1.6	Alliance ProMotion 6422	2/DRAM	15/13.5	.28	6X
11	USA Flex Family Special	Pentium-133	16	256	1.3	STB Powergraph 64 Video	2/EDO DRAM	15/13.7	.27	8X
12	NEC PowerMate P133	Pentium-133	16	256	1.6	integrated Trio64V+	2/EDO DRAM	15/13.5	.28	6X
13	Xi P133MTower SP	Pentium-133	16	512	1.3	Diamond Stealth64 Video VRAM	2/VRAM	17/15.6	.26	6X
14	Tempest Micro MediaPro P5-133	Pentium-133	16	256	1.3	Diamond Stealth64 Video 2201	2/DRAM	15/13.8	.28	4X
15	Acma zPower 166v	Pentium-166	16	256	1.3	Diamond Stealth64 Video 2201	2/EDO DRAM	15/13.7	.28	6X
16	Netis N5100 Media	Pentium-100	16	256	1.6	Diamond Stealth64 Video VRAM	2/VRAM	15/13.9	.28	4X
17	Vektron Multimedia P-100	Pentium-100	16	256	2.1	Diamond Stealth64 Video VRAM	2/VRAM	15/14.1	.25	6X
18	Micro Express MicroFlex PCI/5133	Pentium-133	16	256	1.6	STB Velocity 64 Video	2/VRAM	15/13.9	.28	4X
19	HiQ Saturn Station	Pentium-166	16	256	1.6	ASUS PCI-AV264CT	2/DRAM	15/13.8	.28	6X
20	Robotech Cobra XLT P-133	Pentium-133	16	256	1.3	Number Nine 9FX Motion 331	2/EDO DRAM	17/15.4	.28	6X

*Best Buy

Gateway 2000

of 176 is above average for a Pentium-120 and high for a system in this price range. If you can spend an extra $90, the P5-133 version will provide you with a 6 percent performance boost in the same configuration.

NO. 4: MICRON P133 MILLENNIA

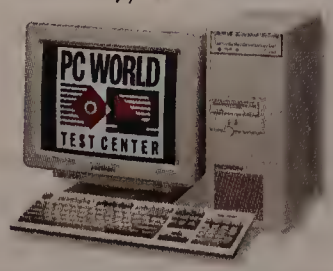
PROS: Loaded with features, 8X CD-ROM drive

CONS: Reports of DOA components have risen

A $300 price drop to $2349 moves the P133 Millennia from the Power chart to the upper echelon of the Budget chart. It's loaded with memory, secondary cache, and hard disk space, as well as a full complement of multimedia features. Its PC WorldBench score of 182 isn't spectacular, but it's average for a P-133 desktop PC.

Micron's on-screen Windows help is helpful, with photos and even videos of basic hardware maintenance tasks.

Price drops on all the other Millennias we've tested make them good budget machines, too. The P166 Millennia (reviewed in April) now goes for $2549 and the P150 Millennia (reviewed in May) sells for $2449. The P120 and P100 Millennia (both reviewed in March) now cost under $2250. One reason all these systems are so inexpensive is that they're priced with 15-inch monitors.



Micron P133 Millennia

NO. 5: QUANTEX QP5/100 M-3

PROS: Fast P-100; fax-modem, 8X CD-ROM drive

CONS: Low reliability score

The $1799 QP5/100 M-3 is a family-oriented multimedia system that comes with a bunch of games, PerfectWorks integrated software, and several online start-up kits. It's a good choice for home offices where the computer is also used for entertainment. Features like a 1.6GB hard drive, an 8X CD-ROM drive, and a 28.8-kbps fax-modem with voice mail earn this minitower a Best Buy.

If you want a little extra power, there's the $2299 QP5/133 SM-2 (reviewed in July). With a $250 price drop, this fast PC makes a good

		EXPANDABILITY						CUSTOMER SUPPORT			
Modem speed (kbps)	Sound board	Case style	Max. RAM (MB)	Maximum secondary cache (K)	Open SIMM sockets	Open drive bays (ext./int.)	Open slots	Warranty for parts/labor (years)	Weekday toll-free support (hours)	Weekend support	Online support
–	Creative Labs Vibra 16	desktop	128	256	3	1/1	5	3/3	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
–	integrated Vibra 16	desktop	128	512	2	1/0	5	3/3	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
–	–	minitower	128	256	2	2/0	5	3/1	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
–	Creative Labs Vibra 16	compact	128	256	2	2/1	5	3/1	24	Sat., Sun.	BBS, WWW
28.8	WillowPond K130	minitower	128	512	2	2/1	4	1/1	15	Sat., Sun.	BBS, Prodigy, WWW
–	–	compact	136	256	4	0/0	5	3/3	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
28.8	ESS1688 Audio Drive	tower	128	512	2	3/1	4	1/1	10	–	AOL, BBS, CIS, Prodigy, WWW
–	–	desktop	192	256	4	2/0	5	3/3	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
–	ESS1688 Audio Drive	minitower	128	512	4	3/1	6	2/2	9.5	Sat., Sun.	WWW
–	integrated OPTi 930A	minitower	128	256	2	2/2	5	3/3	24	Sat., Sun.	AOL, BBS, CIS, MSN, WWW
28.8	proprietary 16-bit	minitower	128	512	2	3/1	4	3/3	24	Sat., Sun.	BBS, WWW
–	integrated Vibra 16S	minitower	128	256	2	2/0	6	3/3	24	Sat., Sun.	AOL, BBS, CIS, MSN, WWW
–	Creative Labs Vibra 16	tower	128	512	2	5/2	6	3/3	9	–	WWW
–	DCS 8305	tower	128	512	2	3/2	5	1/1	9	Sat.	–
28.8	Sound Blaster 16	minitower	128	512	2	2/1	3	3/1	9.5	–	BBS, WWW
–	Creative Labs Vibra 16	compact	128	512	2	2/1	6	1/3	10	Sat.	BBS, WWW
14.4	Creative Labs Vibra 16	minitower	128	256	2	2/0	5	1/1	11	–	BBS, CIS, WWW
–	Sound Blaster AWE32	minitower	128	512	2	3/1	7	2/2	9.5	Sat., Sun.	WWW
–	ASUS PCI-AV264CT	minitower	128	512	2	3/2	1	1/2	9	Sat.	BBS, WWW
28.8	Sound Blaster 16	minitower	128	512	2	3/3	4	3/1	9	–	BBS, WWW

Quantex

budget system. It's priced with a huge 2GB hard drive, a 17-inch monitor, multimedia hardware (including an 8X CD-ROM drive), and a 28.8-kbps fax-modem.

New This Month

The following PCs made our Budget Desktops chart for the first time this month. For previously tested PCs on the chart, visit our Web page at http://www.pcworld.com/t20pcs.

NO. 7: BLACKSHIP P150 CYRIMEDIA 6X86

PROS: Inexpensive, fast, 28.8-kbps fax-modem
CONS: Unimpressive monitor, limited support

The $1695 CyriMedia 6x86 is a great bargain. It uses a Cyrix 6x86-P150+ running at 120 MHz to achieve a PC WorldBench score of 196—about average for a P-166 desktop PC. It's loaded with features, including a huge cache, a Matrox graphics card, and a SupraExpress fax-modem. In short, at this price the P150 CyriMedia 6x86 is hard to ignore.

Blackship P150

Overall, though, it's a generic tower PC. The ESS1688 Audio Drive sound card is a cheap one that we've seen popping up a lot lately in bargain PCs; it delivers decent sound, but at this time we don't know much about its performance. Likewise, the CD-ROM drive and speakers are from little-known vendors. But the only low-cost component that we found to be notably low-quality was the Tatung 15-inch monitor, which provided a dull picture and couldn't support the VESA-standard 75-Hz refresh rate at 800 by 600 resolution, leading to some screen flicker.

The CyriMedia comes with several Microsoft programs, including Works, Golf, Money, and Encarta. But when you see Blackship's low price, keep in mind that technical support is limited to 10 hours, Monday through Friday. In addition, the company guarantees its parts only for one year.

NO. 15: ACMA ZPOWER 166V

PROS: Multimedia, fax-modem, PC Card slots
CONS: Poor monitor, limited expandability ▶

Except for limited support hours and a somewhat jumbled interior, the zPower 166V is a good PC. This multimedia minitower is attractively priced at $2295 and comes with plenty of software for home users, including Microsoft's Encarta, Money, and Works. Our test machine earned a PC WorldBench score of 199, which is good for a P-166. The graphics card (a Diamond Stealth64 Video 2201) and sound card (a Sound Blaster 16) are quality components. However, the Princeton monitor that came with our PC exhibited a slight flicker and faint horizontal lines. Acma offers a good warranty—three years for parts and one year for labor—but toll-free support is available 9.5 hours on weekdays only.

Acma

Beyond the Top 20

We tested these systems along with the others, but they didn't score high enough to reach the Top 20 Budget Desktops chart. For write-ups, see PC World Online (http://www.pcworld.com/t20pcsnaps).

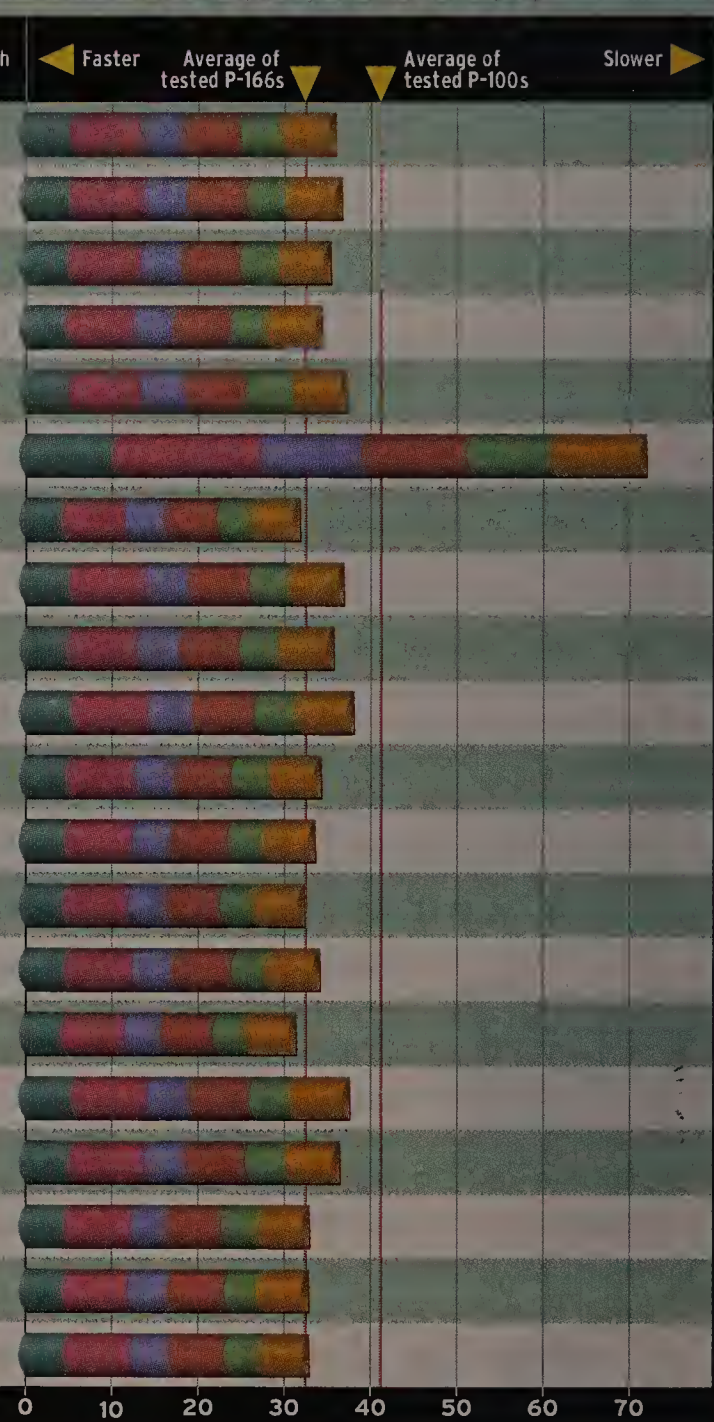
- **Alaris Puma P166+**
- **Caliber Voyager VI P200**
- **Maximus Magna ProMedia P133**
- **Micro Express MicroFlex PCI/6200**

TOP 20 BUDGET DESKTOPS

	Systems	CPU	RAM (MB)	Secondary cache (K)	PC WorldBench Score
1	Dell Dimension P100t*	Pentium-100	16	256	173
2	Dell OptiPlex GXM 5100*	Pentium-100	16	256	170
3	Gateway 2000 P5-12*	Pentium-120	16	256	176
4	Micron P133 Millennia*	Pentium-133	16	256	182
5	Quantex QP5/100 M-3*	Pentium-100	16	256	167
6	Compaq Prolinea 575e	Pentium-75	8	–	86
7	Blackship P150 CyriMedia 6x86	Cx6xB6-P150+	16	512	196
8	Compaq Prolinea 5120	Pentium-120	16	256	169
9	Micro Express MicroFlex-686/P120+	Cx6xB6-P120+	16	256	175
10	NEC PowerMate V100	Pentium-100	16	256	163
11	USA Flex Family Special	Pentium-133	16	256	181
12	NEC PowerMate P133	Pentium-133	16	256	185
13	Xi P133MTower SP	Pentium-133	16	512	193
14	Tempest Micro MediaPro P5-133	Pentium-133	16	256	183
15	Acma zPower 166V	Pentium-166	16	256	199
16	Netis N5100 Media	Pentium-100	16	256	166
17	Vektron Multimedia P-100	Pentium-100	16	256	171
18	Micro Express MicroFlex PCI/5133	Pentium-133	16	256	190
19	HiQ Saturn Station	Pentium-166	16	256	190
20	Robotech Cobra XLT P-133	Pentium-133	16	256	189

*Best Buy

PERFORMANCE



Word 7.0 for Windows 95
Excel 7.0 for Windows 95
Picture Publisher 6.0 for Windows 95
Paradox 5.0 for Windows
WordPerfect 6.1 for Windows
1-2-3 release 5 for Windows

HOW WE TEST A higher PC WorldBench score is better. All systems are tested with PC WorldBench, PC World's application-based benchmark. All PCs have Windows 95, and video resolution is set to 800 by 600 in 256 colors. We run automated scripts on six popular business applications, performing common tasks such as spelling checks, scrolls, saves, sorts, and recalculations. The PC WorldBench score is a sum of the weighted result of each script: Word (25 percent), Excel (20 percent), Picture Publisher (15 percent), Paradox (15 percent), WordPerfect (15 percent), and 1-2-3 (10 percent). For more details on our benchmark and how we run it, see PC World Online (http://www.pcworld.com).

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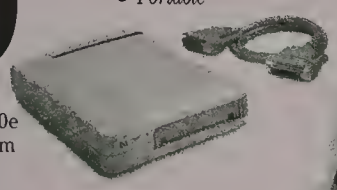

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S/A2

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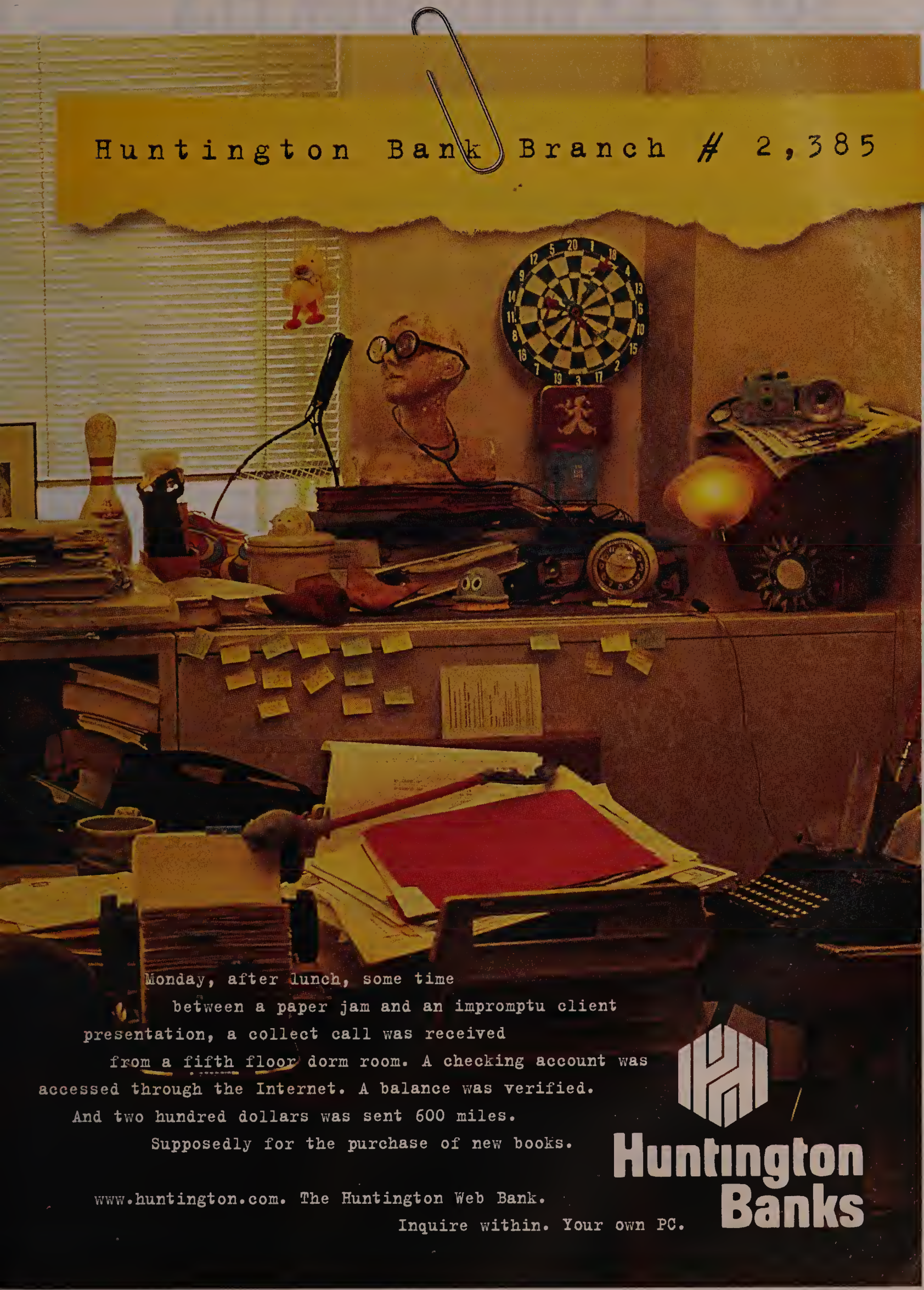

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PC WORLD

TOP 20 NOTEBOOK PCs

	POWER NOTEBOOKS	Last month	Last reviewed	Street price (6/15/96)	CPU	Comments
1	Toshiba Satellite Pro 420CDS 800/457-7777 www.toshiba.com	–	new	$3298	Pentium-100	Powerful multimedia portable, straightforward design is sturdy and comfortable.
2	Dell Latitude XPi P133ST 800/613-3355 www.dell.com	1	Aug 96	$5099	Pentium-133	Fast, well-built notebook priced with 24MB of RAM; no CD-ROM option.
3	Toshiba Tecra 720CDT 800/457-7777 www.toshiba.com	–	new	$6299	Pentium-133	Cutting-edge features, including 6X CD-ROM drive; 4.3-hour battery life; very heavy.
4	Toshiba Portégé 610CT 800/457-7777 www.toshiba.com	8	Mar 96	$3199	Pentium-90	Few subnotes make the grade, but this one is comfy; nice screen, sound, and video.
5	WinBook XP5 P120 800/468-2162	5	Apr 96	$3499	Pentium-120	Fast; great keyboard, long battery life; poor reliability score.
6	IBM ThinkPad 760E 800/772-2227 www.ibm.com	–	new	$6344	Pentium-133	Fastest notebook to date has great features, but high price and short-ish battery life.
7	AST Ascentia J30 800/876-4278 www.ast.com	7	July 96	$2999	Pentium-100	$330 price drop, long battery life, built-in modem; needs 8MB more of RAM.
8	Austin Edge CD P133 800/952-9816 www.austindirect.com	–	new	$3945	Pentium-133	Best deal you can get on a fast multimedia portable; no reliability data.
9	NEC Versa 4080H 800/632-4636 www.nec.com	–	Apr 96	$4448	Pentium-120	Huge price drop pulls this speedy multimedia notebook back onto the chart.
10	Micron Millennia Transport 800/438-3343 www.micron.com	6	Aug 96	$4998	Pentium-133	Fast and loaded, but its 3.3-hour battery life can't compare with top power notes[1].
	BUDGET NOTEBOOKS					
1	Toshiba Satellite 100CS 800/457-7777 www.toshiba.com	1	June 96	$1999	Pentium-75	If you need an inexpensive, no-frills Pentium notebook, this one is perfect.
2	NEC Versa 550D 800/632-4636 www.nec.com	6	Aug 96	$1699	Cx5x86-100	Sleek, sturdy design with crisp screen; affordable, but you sacrifice performance.
3	IBM ThinkPad 365CS 800/772-2227 www.ibm.com	–	Aug 96	$1999	IBM 4x86-75	A $600 price drop makes this well-built but slow ThinkPad a good budget system.
4	Sharp PC 3020 800/237-4277 www.sharp-usa.com	7	June 96	$1699	Cx5x86-100	Low-cost alternative to P-75 notebooks features good battery life, good screen.
5	WinBook XP5 P75 800/468-2162	8	Aug 96	$1999	Pentium-75	Good performance with just 8MB of RAM; built-in fax-modem; low reliability score.
6	Digital HiNote VP 800/642-4532 www.digital.com	–	new	$2499	Pentium-100	Delivers great speed for your money and features a bright dual-scan screen.
7	AcerNote Light 356 800/733-2237 www.acer.com	–	new	$2298	Pentium-100	Good price for light, comfortable P-100 notebook; screen is disappointing, though.
8	Austin Edge XP 100 800/952-9816 www.austindirect.com	–	new	$2447	Pentium-100	Lightweight speedster has super screen; slim design means cramped keyboard.
9	CTX EZ Book 600CDT P75 800/888-9052	10	Aug 96	$2299	Pentium-75	You don't usually see multimedia notebooks this cheap; long battery life is a plus.
10	Magitronic 550 Series 770/849-0667 www.magitronic.com	9	July 96	$2549	Am5x86-P75	Multimedia notebook priced with 20MB of RAM; battery life is a bit disappointing.

Best Buy See features chart, page 220; performance chart, page 224.

[1] To order fax copies of system reviews, call 800/434-4495 from a touch-tone phone and use your credit card. You can order next month's reviews in advance: Power Desktops, Budget Desktops, or Notebook PCs Top 20 charts and capsule reviews ($9.95, available August 28). You can also order a previous month's Top 20 chart with capsule reviews plus features and performance charts ($4.50) and individual capsule reviews with features and performance charts ($1.50 each). Prices effective for the U.S. and Canada. Foreign orders are $15 for advance

THE NOTEBOOK MARKET is moving full tilt. Just two months after we reviewed Gateway's Solo S5-120XL, the company replaced it with a P-133 version, which we will review soon. Several budget notebooks have been discontinued, including Toshiba's Satellite T2130CS and T2130CT.

Hot new notebooks include multimedia models and fast P-100 portables. This month seven new notebooks hit the chart—four power, three budget. Notable systems that didn't make it include the Digital HiNote Ultra II and the TI Extensa 570CDT. See their reviews on PC World Online (http://www.pcworld.com/t20pcsnaps).

SCORECARD

Overall rating	PC WorldBench score	Performance	Price	Reliability	Features and design	Service and support	Battery life (hours)	Battery life	Traveling weight	Reader service number	Fax reprint number[1]
87	142	good	average	best	good	good	4:02	good	heavy	718	3771
86	166	very good	expensive	good	very good	good [2]	5:20	very good	average	719	3764
85	160	very good	very expensive	best	outstanding	good	4:23	good	very heavy	720	3772
84	99	satisfactory	inexpensive	best	good	good	5:09	very good	light	721	3752
82	145	very good	average	poor	good	good	6:19	outstanding	average	722	3736
82	177	outstanding	very expensive	fair	very good	good	2:02	satisfactory	average	–	3773
81	117	good	inexpensive	fair	good	good [2]	5:12	very good	light	723	3759
78	166	very good	average	[3]	good	[3]	3:39	good	heavy	724	3774
78	131	good	average	fair	good	[3]	3:35	good	average	725	3741
78	163	very good	expensive	[3]	very good	[3]	3:22	good	heavy	726	3765
▲ Percentage of overall rating for power notebooks:		Performance 22 percent	Price 14 percent	Reliability 22 percent	Features 16 percent	Support 10 percent	Battery life 8 percent		Weight 8 percent		
82	86	good	average	best	satisfactory	good	3:35	good	average	727	3754
77	75	satisfactory	inexpensive	fair	satisfactory	[3]	2:59	good	average	728	3767
77	62	poor	average	fair	satisfactory	good	3:50	good	average	–	3775
76	79	satisfactory	inexpensive	[3]	satisfactory	[3]	4:28	good	average	729	3757
76	91	good	average	poor	good	good	4:05	good	average	730	3768
75	139	very good	expensive	[3]	good	[3]	3:36	good	light	731	3776
75	118	good	average	[3]	good	[3]	2:57	good	light	732	3777
74	132	very good	expensive	[3]	good	[3]	3:27	good	light	733	3778
73	84	satisfactory	average	[3]	good	[3]	6:12	outstanding	heavy	734	3770
72	117	good	expensive	[3]	good	[3]	2:24	satisfactory	heavy	735	3769
▲ Percentage of overall rating for budget notebooks:		Performance 14 percent	Price 22 percent	Reliability 22 percent	Features 16 percent	Support 10 percent	Battery life 8 percent		Weight 8 percent		

Top 20s, $8 for previous months' Top 20s, and $4 for individual reviews. [2] Limited data; score is based on responses for this company and average of all companies. [3] Insufficient data. For more information about all products in this table, circle reader service no. 909.

POWER NOTEBOOKS

This Month's Best Buys

NO. 1: TOSHIBA SATELLITE PRO 420CDS

PROS: Fast P-100, nice screen, built-in AC adapter

CONS: Single speaker, small hard drive

Somewhere between the super-expensive Toshiba Tecra 720CDT and the budget-level Satellite 100CS is the $3298 Toshiba Satellite Pro 420CDS. With its high-end features and low-cost design, the 420CDS is perfect for people who want multimedia on the road but don't want to spend a fortune.

The 420CDS has a 6X CD-ROM drive, 16-bit audio, and VESA local bus video for ably handling multimedia presentations. The notebook's 11.3-inch dual-scan screen is crisp and bright, although it doesn't give you the range of viewing angles that an active-matrix screen does. Of course, like most notebooks it can still be hooked up to a monitor. ▶

Toshiba Satellite Pro

TOP 20 NOTEBOOK PCs — STANDARD FEATURES

	POWER NOTEBOOKS	CPU	Traveling weight (pounds)[1]	RAM (MB)	Hard drive (MB)	Color screen type	Screen diagonal (inches)	Screen resolution	Maximum screen colors	Battery type	Pointing device
1	Toshiba Satellite Pro 420CDS*	Pentium-100	8.8	16	772	dual-scan	11.3	800 x 600	65,536	lithium ion	eraserhead
2	Dell Latitude XPi P133ST*	Pentium-133	7.2	24	1215	active	11.3	800 x 600	256	lithium ion	trackball
3	Toshiba Tecra 720CDT	Pentium-133	10.6	16	1130	active	12.1	1024 x 768	16.8 million	lithium ion	eraserhead
4	Toshiba Portégé 610CT	Pentium-90	6.4	8	720	active	9.5	640 x 480	65,536	lithium ion	eraserhead
5	WinBook XP5 P120	Pentium-120	7.4	16	1295	active	10.3	640 x 480	65,536	lithium ion	eraserhead, touchpad
6	IBM ThinkPad 760E	Pentium-133	7.8	24	1080	active	12.1	800 x 600	65,536	lithium ion	eraserhead
7	AST Ascentia J30	Pentium-100	6.6	8	810	active	10.4	800 x 600	65,536	lithium ion	eraserhead
8	Austin Edge CD P133	Pentium-133	9.2	16	1358	active	11.3	800 x 600	256	lithium ion	touchpad
9	NEC Versa 4080H	Pentium-120	8.2	16	1080	active	10.4	800 x 600	256	lithium ion	touchpad
10	Micron Millennia Transport	Pentium-133	9	16	1215	active	11.3	800 x 600	65,536	lithium ion	eraserhead, touchpad
	BUDGET NOTEBOOKS										
1	Toshiba Satellite 100CS*	Pentium-75	7.6	8	540	dual-scan	10.4	640 x 480	256	NiMH	eraserhead
2	NEC Versa 550D*	Cx5x86-100	7.4	8	540	dual-scan	10.4	640 x 480	256	NiMH	trackball
3	IBM ThinkPad 365CS	IBM 4x86-75	7.2	8	540	dual-scan	10.4	640 x 480	256	NiMH	eraserhead
4	Sharp PC 3020	Cx5x86-100	7.2	8	500	dual-scan	10.4	640 x 480	256	NiMH	touchpad
5	WinBook XP5 P75	Pentium-75	7.4	8	540	dual-scan	10.4	640 x 480	256	lithium ion	eraserhead
6	Digital HiNote VP	Pentium-100	6.8	16	810	dual-scan	10.4	800 x 600	256	NiMH	touchpad
7	AcerNote Light 356	Pentium-100	6.8	16	810	dual-scan	10.4	640 x 480	65,536	NiMH	touchpad
8	Austin Edge XP 100	Pentium-100	6.8	16	814	dual-scan	10.4	640 x 480	256	NiMH	eraserhead
9	CTX EZ Book 600CDT P75	Pentium-75	9.2	8	540	active	10.4	640 x 480	65,536	NiMH	eraserhead
10	Magitronic 550 Series	Am5x86-P75	8.6	20	543	active	10.4	640 x 480	256	NiMH	touchpad

*Best Buy [1]Includes computer, adapter, power cord, floppy drive, and CD-ROM drive if notebook has one.

With a PC WorldBench score of 142, the 420CDS is the fastest Pentium-100 notebook we've tested. This is particularly notable considering that Toshiba left out a secondary cache in order to shave some dollars off the price. At 8.8 pounds, it's also fairly light for a multimedia notebook. The dual-scan display, which is lighter than an active-matrix version, certainly helps, but the fact that the AC adapter is built into the system helps cut its traveling weight by about 1 pound. All you have to carry is a power cord. What's more, the 420CDS runs for more than 4 hours on a single charge of its lithium ion battery.

The 420CDS's keyboard is large and comfortable. Its eraserhead pointing device is responsive. Beneath the wrist rest is a single speaker that emits respectable 16-bit audio, but it's not as good as stereo speakers' sound.

Overall, though, the Satellite Pro 420CDS is a well-built multimedia notebook that won't break the bank. In our ongoing fax-back survey, readers continue to give Toshiba the highest marks for reliability.

NO. 2: DELL LATITUDE XPI P133ST

PROS: Fast, long battery life, large screen

CONS: No internal CD-ROM option, cramped keyboard, somewhat reckless trackball

Dell Latitude

With a PC WorldBench score of 166, the $5099 Latitude XPi P133ST is a fast portable. Its speed, 5.3-hour battery life, and 7.2-pound traveling weight make it a Best Buy.

The XPi's NeoMagic video chip has a fast 128-bit core and 1MB of embedded video RAM to accelerate Windows 95. The crisp 11.3-inch active-matrix screen displays your work at 800 by 600 resolution. The Latitude is sturdy overall, but its keyboard is cramped and the trackball a bit unruly. Dell now offers a multimedia Pentium-133 notebook, which we will review soon.

		EXPANDABILITY					CUSTOMER SUPPORT			
CD-ROM drive speed	Modem speed (kbps)	Maximum RAM (MB)	Modular expansion bays	Bay for second battery	Optional docking station	Infrared port	Warranty for parts/labor (years)	Weekday toll-free support (hours)	Weekend support	Online support
6X	–	40	1	○	●	●	3/3	24	Sat., Sun.	BBS, CIS, MSN, WWW
–	–	40	0	○	●	●	3/3	24	Sat., Sun.	AOL, BBS, CIS, WWW
6X	28.8	144	1	○	●	●	3/3	24	Sat., Sun.	BBS, CIS, MSN, WWW
–	–	40	0	○	○	●	3/3	24	Sat., Sun.	BBS, CIS, MSN, WWW
–	14.4	32	0	●	●	●	1/1	13	Sat.	BBS
–	28.8	80	1	●	●	●	3/3	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
–	14.4	40	0	○	●	●	3/3	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
4X	–	40	1	●	○	●	1/1	24	Sat., Sun.	BBS, WWW
4X	–	40	0	●	●	●	3/3	24	Sat., Sun.	AOL, BBS, CIS, MSN, WWW
4X	28.8	48	2	●	○	●	3/1	24	Sat., Sun.	CIS, WWW
–	–	40	0	○	●	○	1/1	24	Sat., Sun.	BBS, CIS, MSN, WWW
–	–	24	0	○	○	○	1/1	24	Sat., Sun.	AOL, BBS, CIS, MSN, WWW
–	–	24	0	○	○	●	1/1	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
–	–	40	0	○	○	●	1/1	24	Sat., Sun.	BBS, CIS, WWW
–	14.4	32	0	○	●	○	1/1	13	Sat.	BBS
–	–	40	1	●	●	○	1/1	14	–	AOL, BBS, CIS, WWW
–	–	40	0	○	○	○	3/3	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
–	–	24	1	●	○	●	1/1	24	Sat., Sun.	BBS, WWW
2X	–	32	1	●	○	●	2/2	24	Sat., Sun.	BBS
4X	–	36	1	●	○	●	2/2	24	Sat., Sun.	BBS, WWW

New This Month

The following PCs made our Power Notebooks chart for the first time this month. For previously tested PCs on the chart, visit our Web page at http://www.pcworld.com/t20pcs.

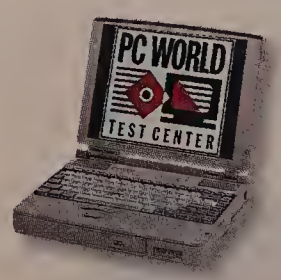
No. 3: TOSHIBA TECRA 720CDT

PROS: Amazing display, cutting-edge technology, 1130MB hard drive, 6X CD-ROM drive, fax-modem
CONS: Hefty, very expensive, weak audio

It's got an embarrassing weight problem and a scary price, but overall, Toshiba's new $6299 Pentium-133–based Tecra 720CDT is a killer portable.

The 720CDT's 12.1-inch active-matrix screen not only can show applications at 1024 by 768 and 65,536 colors, it can display up to 1280 by 1024 pixels in its virtual desktop mode. What's visible at one time is 1024 by 768, but by moving the mouse you can bring the hidden portion of the desktop on screen.

The Tecra is nicely configured with a 6X CD-ROM drive, an infrared port, and a 28.8-kbps fax-modem with telephony capabilities. It has 16-bit sound, but the audio sounded tinny to us. A fan à la today's desktop PCs keeps things cool.

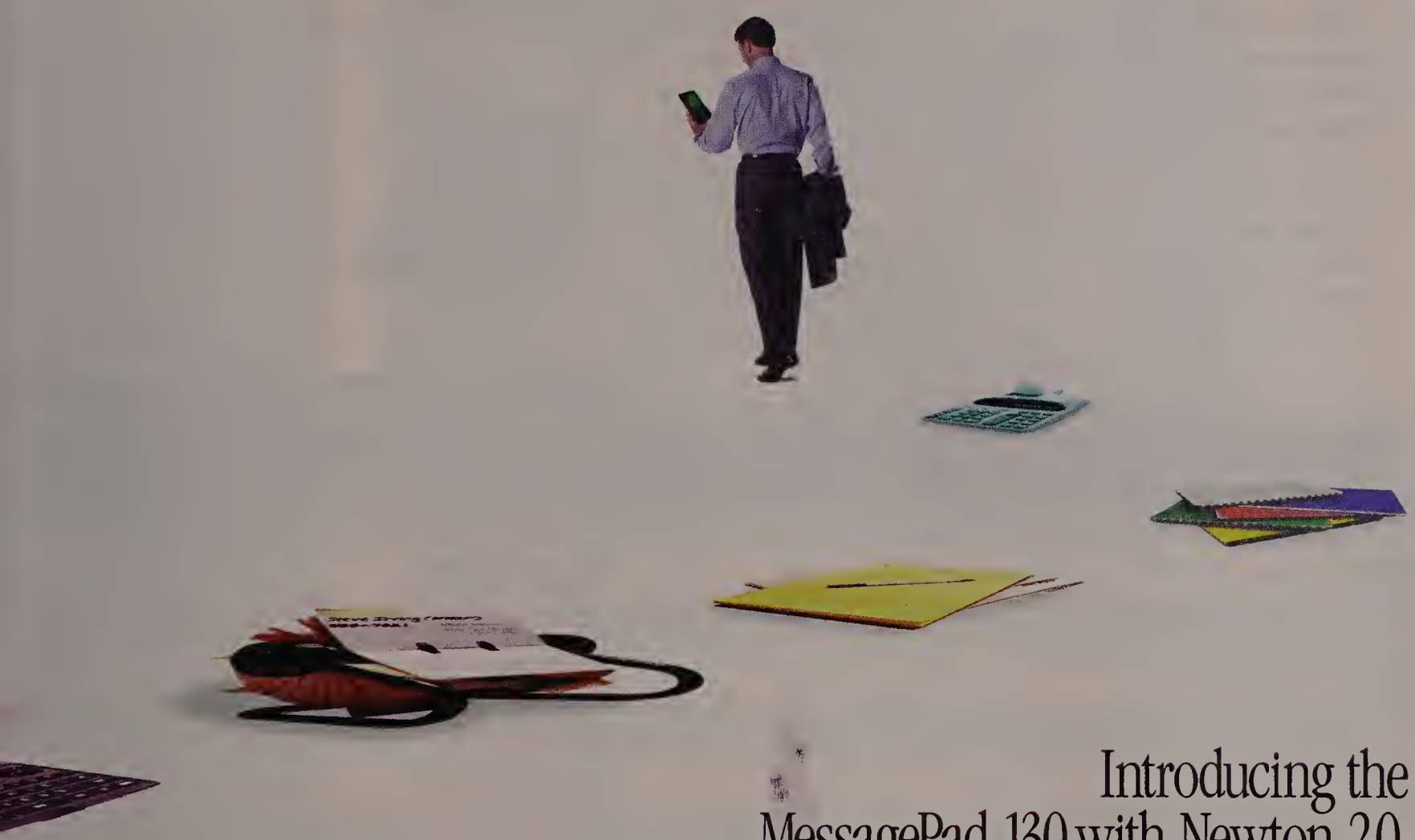


Toshiba Tecra

The Tecra 720CDT's keyboard is comfortable and responsive. Its eraserhead pointing device is easy to control. Thanks to the notebook's 64-bit multimedia PCI graphics controller, screen redraws are fast and video playback is smooth. The Tecra scored 160 in our PC WorldBench test—among the five highest scores we've seen. It supports Zoomed Video and Card Bus, two new standards that open the door to faster, more powerful PC Card peripherals.

All the extras cost the Tecra in portability: With floppy drive in tow, it weighs 10.6 pounds and measures 3 inches thick. Yet despite all the weight it's carrying around, the Tecra managed to run for 4.3 hours in our battery test. ▶

Go through life with less baggage.



Introducing the MessagePad 130 with Newton 2.0.

The farther we go, it seems, the more we're asked to bring with us. The names and numbers of clients past and present. Dates, times, and notes from countless meetings. Not to mention a way to get your e-mail.

The new Apple® MessagePad® 130 was designed to lighten your load by making it easier than ever to schedule work, take notes, send and receive e-mails and faxes — or hop on the Internet — from wherever you happen to be. Even in the dark, thanks to its backlit screen.

http://www.info.apple.com

The Newton 2.0 operating system: learn less, do more. The award-winning Newton® 2.0 provides a surprisingly familiar way of working that encapsulates all you do now in a simpler, more concise form. Instead of loading you with complex commands, Newton works the way you do. It even reads your handwriting.

Dozens of new and well-known applications, such as Now Contact, ACT!, Quicken, CompuServe, Meeting Maker, and Eudora Pro, are available for Newton, with more coming. Making it easy to transfer information to and from your PC.

Connect

Pick up a MessagePad and get going! So put down whatever you're doing, and go see the Apple MessagePad 130 at your nearest dealer. Or get our faxback information kit, with details on the complete line of MessagePad products and the latest software. See just how little you have to carry, to have it all.

To get your information kit, visit our Web site or call Apple today!

http://www.info.apple.com/newton/
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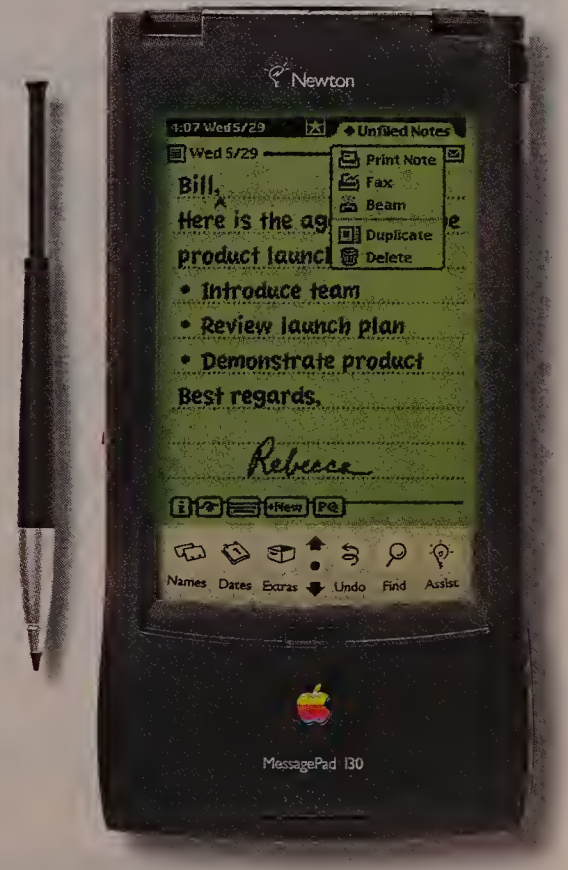

Newton®

Apple®

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NO. 6: IBM THINKPAD 760E

PROS: Fastest notebook to date, bright 12.1-inch screen, built-in 28.8-kbps voice-enabled modem

CONS: Expensive, 2-hour battery life

If you need the fastest notebook on the block, the ThinkPad 760E is for you. With a PC WorldBench score of 177, it's 11 points ahead of the next-fastest portable to be tested with 24MB of RAM, the Dell Latitude XPi P133ST. That score also puts the ThinkPad 760E on a par with several P-133 *desktop* PCs that we've tested. But like fast, hot automobiles, the 760E costs a lot of money—$6344, to be exact. For the price you get what is essentially an upgraded version of the ThinkPad 760C, with a faster P-133 processor and a PCI local bus motherboard.

IBM ThinkPad

If you have the means, it's hard to do better. This slick, black machine is equipped with a roomy 1080MB removable hard drive, a 28.8-kbps fax-modem with voice mail, an infrared port, and PC CardBus support for high-speed add-in cards. The responsive TrackPoint ▶

TOP 20 NOTEBOOK PCs — PERFORMANCE

	POWER NOTEBOOKS	CPU	RAM (MB)	Secondary cache (K)	PC WorldBench score
1	Toshiba Satellite Pro 420CDS*	Pentium-100	16	–	142
2	Dell Latitude XPi P133ST*	Pentium-133	24	256	166
3	Toshiba Tecra 720CDT	Pentium-133	16	256	160
4	Toshiba Portégé 610CT	Pentium-90	8	–	99
5	WinBook XP5 P120	Pentium-120	16	256	145
6	IBM ThinkPad 760E	Pentium-133	24	256	177
7	AST Ascentia J30	Pentium-100	8	–	117
8	Austin Edge CD P133	Pentium-133	16	256	166
9	NEC Versa 4080H	Pentium-120	16	256	131
10	Micron Millennia Transport	Pentium-133	16	256	163
	BUDGET NOTEBOOKS				
1	Toshiba Satellite 100CS*	Pentium-75	8	–	86
2	NEC Versa 550D*	Cx5x86-100	8	–	75
3	IBM ThinkPad 365CS	IBM 4x86-75	8	–	62
4	Sharp PC 3020	Cx5x86-100	8	–	79
5	WinBook XP5 P75	Pentium-75	8	256	91
6	Digital HiNote VP	Pentium-100	16	–	139
7	AcerNote Light 356	Pentium-100	16	–	118
8	Austin Edge XP 100	Pentium-100	16	–	132
9	CTX EZ Book 600CDT P75	Pentium-75	8	256	84
10	Magitronic 550 Series	Am5x86-P75	20	–	117

*Best Buy

Application test times in minutes

Word 7.0 for Windows 95 · Picture Publisher 6.0 for Windows 95 · WordPerfect 6.1 for Windows · Excel 7.0 for Windows 95 · Paradox 5.0 for Windows · 1-2-3 release 5 for Windows

HOW WE TEST A higher PC WorldBench score is better. All systems are tested with PC WorldBench, PC World's application-based benchmark. All PCs have Windows 95, and video resolution is set to 800 by 600 in 256 colors. We run automated scripts on six popular business applications, performing common tasks such as spelling checks, scrolls, saves, sorts, and recalculations. The PC WorldBench score is a sum of the weighted result of each script: Word (25 percent), Excel (20 percent), Picture Publisher (15 percent), Paradox (15 percent), WordPerfect (15 percent), and 1-2-3 (10 percent). For more details on our benchmark and how we run it, see PC World Online (http://www.pcworld.com).

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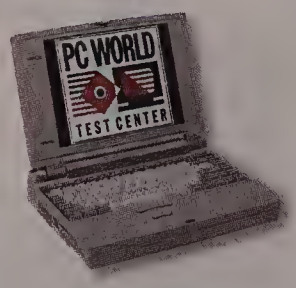
eraserhead and tilting keyboard make the system a pleasure to use, and the 12.1-inch active-matrix screen is brilliant. The impressive screen adds little to the notebook's weight, which tops out at just 7.8 pounds. For multimedia presentations, the 760E has built-in 16-bit sound and stereo speakers that provide terrific audio, but you won't find a CD-ROM drive option for this Pentium-133 model. For that you will need to buy the ThinkPad 760ED, which is otherwise identical.



Toshiba 100CS

The ThinkPad 760E needs to refuel frequently. Plan on finding an outlet after only 2 hours. You can add an extra battery in a special expansion bay located under the keyboard.

In addition to round-the-clock tech support, IBM offers an extensive on-screen orientation and CoSession for Windows remote control software that allows IBM's tech support personnel to troubleshoot your ThinkPad via modem.

NO. 8: AUSTIN EDGE CD P133

PROS: Good price, fast, sturdy, good speakers
CONS: Poor keyboard layout, CD-ROM drive doesn't fit well in its drive bay

The $3945 Austin Edge CD P133 is a rugged, high-end portable for power users who are also on a budget. It's the least expensive Pentium-133 multimedia notebook on the chart by more than $1000. It's also one of the fastest we've tested—its PC WorldBench score of 166 ties it for second on our current all-time fastest notebooks list. As far as multimedia notebooks go, it's highly mobile; with all the essentials it weighs just 9.2 pounds. Its lithium ion battery lasts more than 3.5 hours.

Austin Edge

Our Edge CD P133 came equipped with 16MB of RAM, a 1.4GB hard drive, and a 4X CD-ROM drive that you can swap for the floppy drive. According to Austin, by the time you read this the standard CD-ROM drive will be 6X at no extra cost. In addition, the company will be including a 28.8-kbps fax-modem with speakerphone.

The Edge CD P133's 11.3-inch active-matrix screen displays at 800 by 600 in bright, crisp colors (albeit only 256 of them). The notebook comes with particularly good stereo speakers and sound. You can control the bass, treble, and balance from the keyboard. The touchpad pointing device is easy to control, but if you prefer cursor keys, the keyboard has special keys for accessing Windows 95's Start menu and Explorer.

The Edge CD P133 feels very sturdy. We did notice, however, that the CD-ROM drive didn't fit well in the drive bay. In addition, we had a problem with the placement of the right <Shift> key. It's at the far edge of the keyboard past the cursor keys, which caused us to continually hit the question mark key when we meant to shift.

Aside from an airline guide, which comes with almost every notebook we test, the Edge CD P133 includes very little application software or additional utilities.

BUDGET NOTEBOOKS

This Month's Best Buys

NO. 1: TOSHIBA SATELLITE 100CS

PROS: Good value, nice screen and keyboard
CONS: No bundled application software

The $1999 Satellite 100CS is a perfect first notebook. You get Pentium power, a good dual-scan screen, and an excellent design for a budget price. It doesn't have any extras like a super-VGA screen, built-in sound, or an infrared port, but it's well built and comes from a reputable vendor.

The 100CS has a bright 10.4-inch dual-scan display with good controls for brightness and contrast. Its keyboard is comfortable and responsive, and its eraserhead pointing device is easy to manipulate.

Because it comes with just 8MB of RAM it's not the fastest P-75, but it's fast for a notebook in its price range. An 8MB upgrade module costs $459 and should boost performance by about 15 percent.

Toshiba doesn't bundle any application software with the 100CS, but it does have several helpful utilities to get you acquainted with your PC. An on-screen program monitors battery life, which should top out at around 3.5 hours with all the power management features activated.

NO. 2: NEC VERSA 550D

PROS: Very low price, nice design, good display
CONS: No bundled application software

The $1699 NEC Versa 550D is a solid, though not terrific, performer that's well designed and inexpensive. With a 100-MHz Cyrix 5x86 CPU and 8MB of RAM, the Versa 550D achieved a PC WorldBench score of 75, which makes it just a slightly slower performer than the average 8MB Pentium-75 notebook. The 550D's battery life, which clocks in at just shy of 3 hours, is also acceptable. And at 7.4 pounds, including the trim AC adapter, it's pretty easy to carry.

NEC Versa

Overall, the Versa 550D is sleek and sturdy, with gentle curves and protected latches. We especially like the range of brightness and contrast that you can achieve on the 10.4-inch dual-scan display.

A trackball with large mouse buttons is located in the center of the wrist rest. The buttons work fine, but the trackball's rough texture has its pros and cons: It's easier to control, but it also creates a disconcerting grinding sensation.

NEC doesn't bundle any application software with its Versa 550D, but it does provide good documentation.

New This Month

The following PCs made our Budget Notebooks chart for the first time this month. For previously tested PCs on the chart, visit our Web page at http://www.pcworld.com/t20pcs.

NO. 6: DIGITAL HINOTE VP

PROS: Exceptional P-100 performance, good battery life, bright display
CONS: No built-in CD-ROM option

At every turn, the $2499 HiNote VP exceeded our expectations. With a PC WorldBench score of 139, it's the sec- ▶

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0.25mm	0.25mm	0.28mm	0.25mm	0.25mm	0.28mm
13.9"**	13.9"**	13.8"**	16"**	16"**	15.6"**
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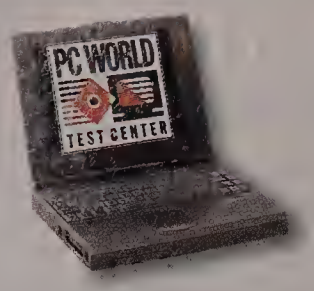
Circle 144 on reader service card



Digital HINote VP

ond-fastest P-100 notebook we've tested, outperforming several P-120s. Its 3.6-hour battery life is impressive considering that the HiNote VP uses a NiMH battery instead of the longer-lasting lithium ion kind.

In contrast to Digital's slim Ultra II notebook, the HiNote VP's keyboard is roomy, comfortable, and responsive. Its 10.4-inch dual-scan screen is vivid and has excellent controls for brightness and contrast. The HiNote VP is lightweight at just 6.8 pounds. The AC adapter is one of those optional internal kinds that can take the place of the floppy drive or rest on your desk. If you don't use your floppy drive much, this is a sensible design because all you have to carry around is a power cord. When the adapter is used externally, it looks disturbingly like part of the notebook is falling out.

The bundled software is marginally useful. Our system had CompuServe and America Online, but no modem to log on with. It came with LapLink for Windows 95 for file transfer, but you have to supply the cables. (The HiNote VP doesn't have an infrared port.) Digital backs the HiNote VP with a one-year warranty. Toll-free technical support is limited to weekdays, but you can get round-the-clock support if you purchase Digital's Passport service, which costs $49 the first year.

NO. 7: ACERNOTE LIGHT 356

PROS: Lightweight; comfortable keyboard

CONS: Slow for a P-100 notebook with its configuration, dull screen, one year of free tech support

The $2298 AcerNote Light 356 is a mixed bag, but its attractive price, 6.8-pound traveling weight, and roomy keyboard earn it a spot on our Budget chart. And despite the Pentium-100 notebook's low price, we were happy to see that Acer bundles a couple of useful programs—Sidekick and Quicken.

AcerNote

The AcerNote runs for almost 3 hours on a single NiMH battery—not bad for a budget notebook. It isn't as slim as some notebooks we've seen, but at just 2 inches thick it slips easily into your luggage. The palm rest is just the right size—not so narrow as to be uncomfortable, and not so wide as to cramp the keyboard. You control the mouse with a touchpad that's easy to use.

On the other hand, there are a few shortcomings that prevent the AcerNote from rising higher on the chart. Its PC WorldBench score of 118 is disappointing for a P-100 notebook with 16MB of RAM. While its 10.4-inch dual-scan screen can handle over 65,000 colors, we found it looked washed-out and jittery. What's more, the first notebook Acer sent us broke down during testing. The replacement worked fine.

Acer backs its notebooks with a strong warranty: During the first year the company will replace a defective notebook; over the next two years you can send it in to be fixed. Tech support is available around the clock, but it's free only for the first year. After that you can pay for one of a variety of support plans.

NO. 8: AUSTIN EDGE XP 100

PROS: Affordable, lightweight, excellent screen

CONS: Cramped keyboard, poor sound quality

The $2447 Edge XP 100 doesn't have a lot of frills like an active-matrix screen or a CD-ROM drive, but it's fast, lightweight, and—for a P-100—easy on the wallet. Its PC WorldBench score of 132 is good for a P-100 notebook with 16MB of RAM, while its slim design and 6.8-pound traveling weight are superb for any portable. Even its 3.5-hour battery life is commendable for a notebook with a NiMH battery.

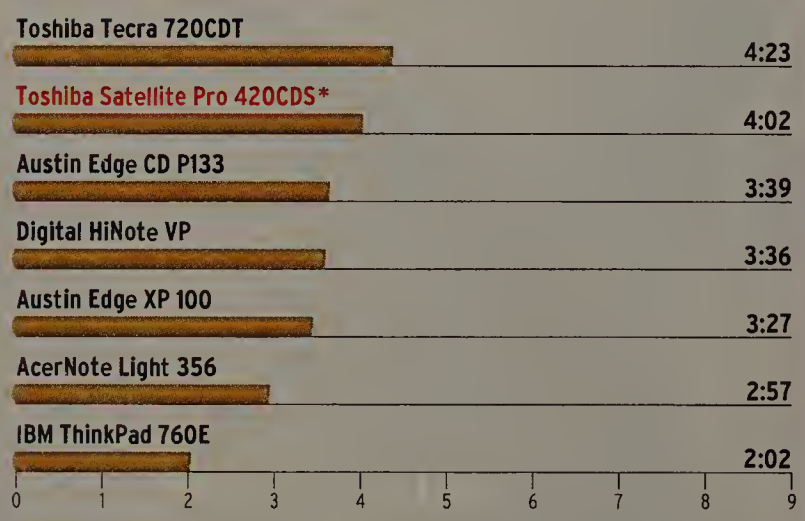
The 10.4-inch dual-scan screen displays only 256 colors, but it's surprisingly sharp. The eraser-head pointing device is responsive, and the mouse buttons are placed at a perfect distance from the keyboard so they're easy to use. On the other hand, the keyboard itself is a bit cramped, with smaller-than-average keys. The right <Shift> key is at the far edge, which caused errors during typing. There are speakers built into the display unit, but they sound distorted.

Austin Edge

Software bundled with the Edge XP 100 is limited. There's an airline flight guide and an antivirus program, but nothing that will help you do your work. ■

TEST REPORT

Notebook Battery Life



*Best Buy

Time in hours:minutes.

HOW WE TESTED We drain and fully recharge the battery twice and set power-saving options to match a consistent profile where possible. Office workers use Windows 95 applications, periodically saving and allowing regular idle time. Notebooks are rotated among workers. We report the time elapsed when the notebook shuts itself off.

Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

Beyond the Top 20

We tested these systems along with the others, but they didn't score high enough to reach the Top 20 Notebook PCs chart. For write-ups, see PC World Online (http://www.pcworld.com/t20pcsnaps).

- Canon Innova Book 360CD
- Digital HiNote Ultra II
- Texas Instruments Extensa 570CDT
- WinBook XP5 P100

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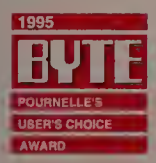

Internet access in over 290 cities in the U.S. and Canada. Software for MACINTOSH, WINDOWS, WINDOWS 95, featuring Netscape Navigator 2.0. EarthLink Network is one of the largest Web space providers in the U.S. and also provides ISDN, Frame Relay, T1 and other Internet services.* *There is a one-time set-up fee of $25.00. Prices for Canada are different.*

Circle 85 on reader service card

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Producing digital art for printing? Developing a multimedia presentation? Need images for your web page? Microtek's new 30-bit *ScanMaker® E6* color flatbed scanner captures images with amazing highlight and shadow detail in stunning lifelike color. The ScanMaker E6 at $599 includes Microtek's award-winning *ScanWizard™* scanning software to descreen, tint, sharpen, blur, darken, lighten, saturate, desaturate, emboss or add other special effects to images right before your eyes — *even before you scan them!*

At this low price, the ScanMaker E6 also includes *Caere's OmniPage Limited Edition®* for scanning pages of text, *U-Lead's PhotoImpact 3.0 (full version)* and *ImagePals Go* for Windows; or *MicroFrontier's Color It!* for Macintosh.

Or ask about the *ScanMaker® E6 Pro™ for* Window's at just $799 which also includes Microtek's *ScanWizard* scanning software and *Caere's OmniPage Limited Edition* as well as the *full-version of Adobe Photoshop*. The *ScanMaker E6 Pro for Macintosh* includes the *full-version of Adobe Photoshop* and the *full-version of Live Picture 2.1* for Macintosh for just $899.

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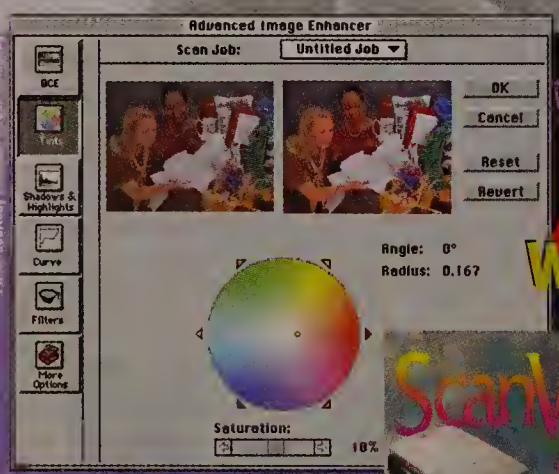
For the location of your nearest Microtek reseller or for more information, call 1-800-654-4160, use our convenient Auto Tech fax-back line at (310) 297-5101, or check out our Web site at **http://www.mteklab.com**.



"MacWEEK (August 7, 1995)"

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MICROTEK ScanMaker E6

- 30-bit color depth
- Incredibly fast single-pass speed
- 600 x 1200 optical resolution
- 4800 dpi maximum resolution
- Includes ScanWizard™, OCR and image-editing software for Windows or Macintosh

Starting at just $599!

MICROTEK

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Circle 159 on reader service card

Win an HP Vectra 500 5/166

Have you ever contacted your PC maker for service and support? Or has your PC been trouble-free? Tell us about it! Fill out and fax in the questionnaire below—even if you have no problems to report, and even if you have responded to this survey before—and we'll enter you in a drawing to win an HP Vectra 500 5/166, a Best Buy Pentium-166 PC in this month's Top 20.

HOW TO ENTER: FOR BEST RESULTS, PHOTOCOPY THIS PAGE. Fax your completed survey to 415/357-4522. Do NOT fax a cover page. Or mail it to *PC World*, Box 9-SS, c/o 800-SCAN, 543 Howard St., San Francisco, CA 94105-3013. Surveys must be received by September 30.
PRIZE: One entry per person. IDG employees and their families are not eligible. One prize will be awarded through a random drawing. *PC World* will make reasonable efforts to contact winners by telephone and fax. If *PC World* is unable to do so within 30 days of the drawing, a new winner will be selected. No purchase necessary. Void where prohibited by law.
HOW TO FILL OUT THE FORM: Print your name (block capital letters) and your fax number, and fill the circles for each digit of your daytime phone number. Then fill out the questionnaire. AVOID GOING OUTSIDE THE LINES!

LAST, FIRST NAME

FAX NUMBER — —

ZIP CODE

Please fill in your daytime phone number below.

1	○	○	○	○	○	○	○	○	○	○
2	○	○	○	○	○	○	○	○	○	○
3	○	○	○	○	○	○	○	○	○	○
4	○	○	○	○	○	○	○	○	○	○
5	○	○	○	○	○	○	○	○	○	○
6	○	○	○	○	○	○	○	○	○	○
7	○	○	○	○	○	○	○	○	○	○
8	○	○	○	○	○	○	○	○	○	○
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How did you get this copy of *PC World*?
○ By subscription ○ On the newsstand ○ From someone else

ABOUT YOUR PC

Who is the manufacturer of the PC you use most frequently?

○ Acer ○ Acma ○ ALR ○ Apple ○ AST ○ AT&T (NCR) ○ Austin (IPC) ○ Axik ○ Blackship ○ Canon ○ Compaq ○ Compudyne
○ Computrend ○ Comtrade ○ CTX ○ Dell ○ Diamond ○ Digital (DEC) ○ DTK ○ EPS ○ Epson ○ Everex ○ Future Tech ○ Gateway 2000
○ Hewlett-Packard ○ HiQ ○ Hyundai ○ IBM ○ Insight ○ Intelesys ○ Leading Edge ○ Micro Express ○ Micron ○ Midwest Micro ○ MIS ○ Nat'l Micro
○ NEC ○ Netis ○ Packard Bell ○ Panasonic ○ PerComp ○ Pionex ○ Polywell ○ Quantex ○ Robotech ○ Samsung ○ Sharp ○ Swan
○ Tangent ○ Texas Instruments ○ Toshiba ○ Twinhead ○ USA Flex ○ Vektron ○ VTech (Expotech, Laser) ○ WinBook ○ Zenith (ZDS) ○ Zenon ○ Zeos ○ Other

What size is this PC?
○ Desktop
○ Notebook/laptop
○ Handheld

What is the CPU?
○ PowerPC
○ Pentium
○ 80486
○ 80386
○ Other

Where did you buy this PC?
○ Local dealer
○ Mail/phone order
○ Direct from field sales force
○ Membership discount store
○ Computer superstore
○ Home electronics store
○ Retail store
○ Value-added reseller
○ Other

After ordering, how long did it take to get your PC?
○ Less than 1 week
○ 1-2 weeks
○ 3-4 weeks
○ More than 4 weeks

Who set up your PC?
○ Dealer/retailer/VAR
○ Staff computer technician
○ Self or coworker

Where do you use this PC? ○ At home/home office ○ At work ○ Both

WHEN YOU FIRST GOT YOUR PC

When did you buy this PC? (Specify month and year.)

○ Jan ○ Feb ○ Mar ○ Apr ○ May ○ June ○ July ○ Aug ○ Sept ○ Oct ○ Nov ○ Dec
○ 91 ○ 92 ○ 93 ○ 94 ○ 95 ○ 96

When you first set up your PC, were any components "dead on arrival" (DOA)?
○ Yes ○ No ○ Don't know

If so, which component was it? (Mark all that apply.)
○ Battery ○ CD-ROM ○ CPU ○ Floppy drive ○ Graphics/video board ○ Hard drive ○ Keyboard ○ Memory ○ Modem/fax board ○ Monitor/screen ○ Motherboard ○ Mouse ○ Power supply ○ Sound board ○ Other

Did your problem occur only after you added your own hardware or software?
○ Yes ○ No ○ Don't know

Would you buy this brand of PC again?
○ Yes ○ No ○ Not sure

How many times have you had a problem with this PC?
○ No problem ever ○ One ○ Two ○ Three ○ Four ○ More than four

If you have had a problem that you have not reported in a previous survey, please fill out the right column. If you are reporting a DOA for the first time, skip to the service section.

NEW PROBLEM REPORT

Answer for the most recent problem—*other than DOA*—not reported in a prior survey.

When did this problem occur? (Specify month and year.)

○ Jan ○ Feb ○ Mar ○ Apr ○ May ○ June ○ July ○ Aug ○ Sept ○ Oct ○ Nov ○ Dec
○ 91 ○ 92 ○ 93 ○ 94 ○ 95 ○ 96

How long was this after you purchased your PC?
○ Less than 1 month ○ 1-3 months ○ 4-6 months ○ 7-12 months ○ More than 12 months ○ Not sure

Did the problem occur as a result of adding new hardware or software?
○ Yes ○ No ○ Don't know

Did the problem occur under warranty?
○ Yes ○ No ○ Don't know

What was the problem finally identified as? (Mark all that apply.)
○ Faulty component ○ Incorrectly installed software ○ Wrong configuration ○ Faulty peripheral ○ Device conflicts ○ OS problem ○ Other ○ Don't know

If a component failed, which one was it? (Mark all that apply.)
○ Battery ○ CD-ROM ○ CPU ○ Floppy drive ○ Graphics/video board ○ Hard drive ○ Keyboard ○ Memory ○ Modem/fax board ○ Monitor/screen ○ Motherboard ○ Mouse ○ Power supply ○ Sound board ○ Other

SERVICE

Please use this section to describe the service and support you received for the problem reported above or the DOA reported at left.

Who fixed your PC?
○ Manufacturer
○ Dealer/store where purchased
○ Manufacturer's authorized repair technician
○ Self ○ Other

What types of service and support did you receive? (Mark all that apply.)
○ Phone ○ On site ○ In store ○ System swap ○ Component swap ○ Factory return

If you received phone service, how long were you on hold?
○ Not at all ○ Less than 1 minute ○ 1-2 minutes ○ 3-5 minutes ○ 6-10 minutes ○ 11-20 minutes ○ More than 20 minutes

How long did it take before you talked to the person who finally helped you?
○ Less than 15 minutes ○ 15 minutes-1 hour ○ 2-5 hours ○ 6-10 hours ○ 11-24 hours ○ 1½-2 days ○ 3-5 days ○ 1 week or more

How long did it take to resolve the problem completely?
○ 1-2 days ○ 3-7 days ○ 8-14 days ○ 15-30 days ○ More than 1 month ○ Never resolved ○ Awaiting resolution

Was it resolved to your satisfaction?
○ Yes ○ No

How would you rate the person(s) who helped you?

	Poor		Good		Excellent
Courtesy	○	○	○	○	○
Knowledge	○	○	○	○	○
Follow-through	○	○	○	○	○

Based on the service and support you received, would you buy this brand of PC again?
○ Yes ○ No

On the whole, how satisfied are you with the service and support you received?
○ Not at all ○ ○ Satisfied ○ ○ Extremely satisfied

PLEASE FAX TO 415/357-4522. FOR BEST RESULTS, PHOTOCOPY THIS PAGE.

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PC WORLD

TOP 10 PRINTERS

	MONOCHROME WORKGROUP PRINTERS	Month tested	Street price (5/14/96)	Overall rating	Speed for plain text	Speed for full-page graphics	Comments	Reader Service Number
1	Lexmark Optra Lx+ 800/891-0331 http://www.lexmark.com	July 96	$1950	91	10.7 ppm	1.4 ppm	**FEATURES:** 16-ppm laser. Standard 4MB of RAM, 600-by-600-dpi resolution (true 1200 dpi with at least 8MB of RAM), 500 sheets input and output. **PROS/CONS:** Excellent print quality. Easy-to-read LCD labels on control panel. Somewhat slow, especially printing full-page graphics.	625
2	HP LaserJet 5M 800/752-0900 http://www.hp.com	July 96	$1799	90	9.5 ppm	1.1 ppm	**FEATURES:** 12-ppm laser. Standard 6MB of RAM, 600-by-600-dpi resolution, 250 sheets input and output. **PROS/CONS:** Very good print quality. Innovative control panel is easy to use. But its maximum paper capacity of 750 sheets is low—all others on the chart except the TI exceed 1000.	626
3	Lexmark Optra R+ 800/891-0331 http://www.lexmark.com	July 96	$1450	89	10.8 ppm	1.2 ppm	**FEATURES:** 16-ppm laser. Standard 2MB of RAM, 600-by-600-dpi resolution, 200 sheets input, 250 output. **PROS/CONS:** Print quality, speed, and basic design similar to the Optra Lx+'s, but less paper capacity. Upgraded model (to be tested for upcoming issue) will have 4MB of RAM standard.	627
4	Okidata OL1200/PS 800/654-3282 http://www.okidata.com	July 96	$1399	82	8.9 ppm	2.3 ppm	**FEATURES:** 12-ppm LED. Standard 6MB of RAM, 600-by-600-dpi resolution, 500 sheets input, 250 output. **PROS/CONS:** $164 price cut makes it the least expensive on the monochrome chart. Good print quality, decent performance, but control panel not as intuitive as the Lexmarks' or HP's.	628
5	TI microLaser PowerPro/12 800/848-3927 http://www.ti.com	July 96	$1439	80	10.4 ppm	2.4 ppm	**FEATURES:** 12-ppm laser. Standard 3MB of RAM, 600-by-600-dpi resolution, 500 sheets input, 250 output. **PROS/CONS:** Fast, inexpensive PostScript printer, but comparatively low paper capacity makes it unfit for high-volume offices—only it and the HP 5M hold less than 1000 sheets maximum.	629
	COLOR WORKGROUP PRINTERS							
1	HP DeskJet 1600CM 800/752-0900 http://www.hp.com	July 96	$1999	91	4.4 ppm	0.5 ppm	**FEATURES:** 8-ppm monochrome/2-ppm color ink jet with 6MB of RAM, 600-by-600-dpi monochrome, 300-by-300-dpi color. **PROS/CONS:** Inexpensive for good print quality and adequate speed. PostScript and ethernet are included. Ink jet pages, unlike a laser's, are sensitive to moisture and light.	630
2	Xerox XPrint 4920 Plus 800/349-3769 http://www.xerox.com	new	$6500	86	5.5 ppm	0.3 ppm	**FEATURES:** 12-ppm monochrome/3-ppm color laser with 16MB of RAM, 600-by-600-dpi monochrome and color. Not Plug and Play ready. **PROS/CONS:** Superb print quality. Optional feeder/printer cabinet ($1341) gives it the highest maximum paper capacity of any color laser on the chart. Slow printing full-page graphics.	631
3	Tektronix Phaser 550 800/835-6100 http://www.tek.com	July 96	$5945	84	5.6 ppm	0.5 ppm	**FEATURES:** 14-ppm monochrome/5-ppm color laser with 8MB of RAM, 600-by-600-dpi monochrome and color (true 1200 dpi with RAM upgrade). **PROS/CONS:** Least expensive color laser on the chart. Versatile paper handling accommodates labels. Proprietary RAM is expensive.	632
4	Lexmark Optra C 800/891-0331 http://www.lexmark.com	July 96	$6400	84	5.8 ppm	0.5 ppm	**FEATURES:** 12-ppm monochrome/3-ppm color laser with 8MB of RAM, 600-by-600-dpi monochrome and color. **PROS/CONS:** Very good color quality. Universal paper tray takes up to legal size, automatically senses size it contains. Expensive, and fuser oil spills easily when printer is moved.	633
5	Apple Color LaserWriter 12/600 PS 800/776-2333 http://www.apple.com	July 96	$6499	80	3.8 ppm	0.3 ppm	**FEATURES:** 12-ppm monochrome/3-ppm color laser with 12MB of RAM, 600-by-600-dpi monochrome and color. **PROS/CONS:** Like the Lexmark, it has very good print quality. But it's pricey, has the same problem with fuser oil spills as the Lexmark, and is the slowest color laser on the chart.	634

Best Buy Windows 95-certified Plug and Play http://www.pcworld.com/t10printers

YOUR OFFICE'S PRIMARY PAPER PUSHER may still be a monochrome laser, but don't be surprised if a color printer soon shares the duty—or takes it over entirely. This month we've expanded our color chart from three rankings to five to make way for new lasers like the Xerox XPrint 4920 Plus. Debuting in second place, it can handle black text as easily as color images. Speed is still an issue, however, as our new pages per minute-based test results indicate. *(continues)* ▶

HOW WE TEST The overall rating for both monochrome and color workgroup printers is based on print quality (27 percent), price (20 percent); features and ease of use (20 percent), speed (15 percent), service and support policies (13 percent), and cost of consumables (5 percent). For all ratings, higher is better. Data based on tests designed and conducted by the PC World Test Center. All rights reserved. For more information about all products in this table, circle reader service no. 902.

The Xerox is the only newly tested workgroup printer to make the Top 10. (Workgroup printers have rated engine speeds of 8 to 16 ppm for monochrome printing.) We tested the Apple Color LaserWriter 12/600 PS for our July review, but it didn't make the chart until this month.

You can spend less than the $6500 that the Xerox XPrint 4920 Plus costs, but you'll get less. The Xerox XPrint 4915 Plus, which we also tested, costs just $4500; its 300-dpi resolution limits its capabilities, however, and it didn't make the chart. The same fate befell the QMS magicolor CX/32, which had uneven print quality as well as a high $6799 price. Our Best Buy is still the inexpensive ($1999), capable HP DeskJet 1600CM color ink jet. It prints well enough to lure you away from a laser, but we realize some diehards won't settle for anything else.

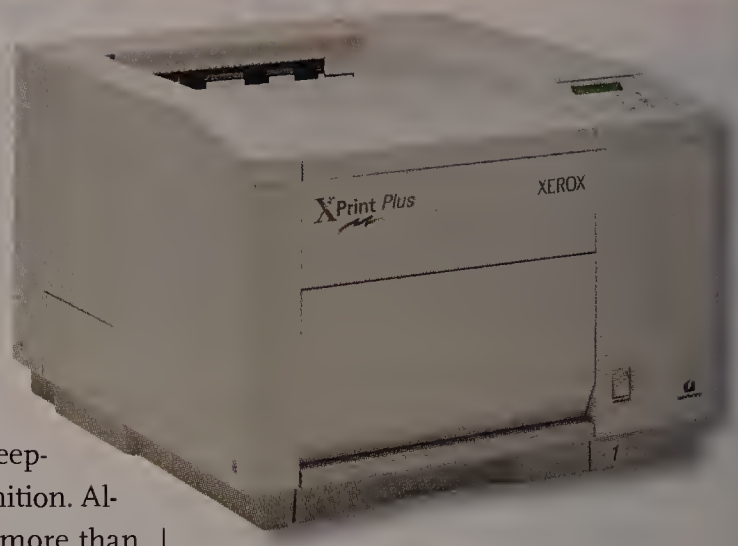
No new monochrome printers were available for this month's review, and Lexmark's Optra Lx+ is still our Best Buy. Next month we'll retest the Lexmark Optra R+, which now comes with 4MB of RAM, and we'll review a new Apple laser.

XEROX PRINT QUALITY PREVAILS

IN THE XPRINT 4920 PLUS'S NAME, "Plus" refers to improvements Xerox made to the print quality of the XPrint 4920 that it introduced about a year ago. Xerox fine-tuned the printer's ability to match its colors with those defined by your application, and to sharpen color prints by substituting true black in areas where previously it would have used inferior, three-color "process" black. The results showed in our tests: Color photographs we printed on the Xerox had deeper shadows and finer line definition. Although the Xerox costs $555 more than the Tektronix Phaser 550 and is a little slower, its better print quality prevails.

Xerox's XPrint 4915 Plus costs $2000 less than the XPrint 4920 Plus, but its 1200-by-300-dpi resolution is good only for text and simple graphics like pie charts—which may be all some offices need. Photographs look grainy, however, and the colors aren't as subtle as those produced by the XPrint 4920 Plus.

The QMS magicolor CX/32's price is high—in part because it includes 32MB of RAM. However, the unit posted just average print speeds. The gray-scale and color images from this 600-dpi printer showed noticeable banding, and transitions from light to dark were rough. We didn't test two other versions of this printer: the $5524 CX/20 with 20MB of RAM, and the $4929 CX/8 with 8MB of RAM. The CX/8 prints at 300-dpi resolution.



XEROX XPRINT 4920 PLUS DELIVERS. The finely drawn black text and improved color rendering on photographic images earn this Xerox high print-quality ratings.

MORE COLOR LASERS COMING UP

CANON'S NEW $10,625 C LBP 360PS color laser has the same Fiery controller as the Digital Colorwriter LSR 2000, which we reviewed in our July issue. Developed by EFI, a leader in desktop publishing technology, the Fiery is supposed to improve the speed of color lasers dramatically. Unfortunately, at our testing deadline EFI had not yet fixed the Fiery's problem with printing text from Word 7.0 for Windows 95. Both Digital and Canon had issued fixes by press time; we'll retest the printers soon.

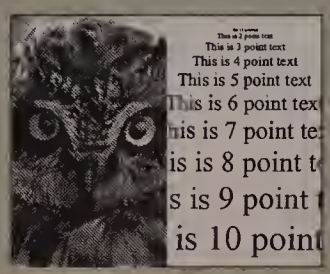
The Digital and Canon are just two of the color lasers we've seen that use the same Canon print engine; the others are the Apple Color LaserWriter 12/600 PS and the Lexmark Optra C. We love the print quality this engine delivers, but we've found a flaw in its design: Its slick fuser oil, part of the subsystem that melts the toner onto the paper, can easily leak when the printer is moved or even tipped a little. The documentation, which of course everyone reads, says you should use the supplied syringe to remove some oil before moving the unit—but it was an untidy operation, and users shouldn't have to deal with it.

—*Bill Underwood* ■

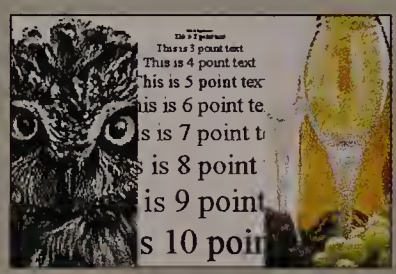
Bill Underwood is a mechanical engineer with over 16 years' experience testing printers. Testing performed by Dave Casini of the PC World Test Center.

PRINT QUALITY SAMPLES

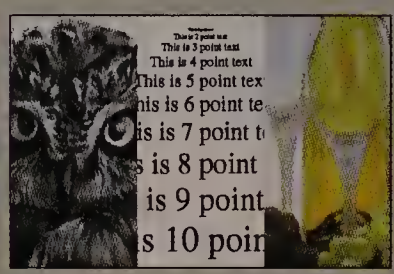
Xerox Laser Earns Best Color Scores Yet



LEXMARK OPTRA LX+
The Lx+'s monochrome print quality is simply top-notch. It produced excellent gray-scale images, and it rendered text with razor-sharp legibility down to very small point sizes.



HP DESKJET 1600CM
An ink-drying heater in the DeskJet 1600CM sharpens its text, gray-scale, and color images. Although the images are very good, they're not quite as crisp as a color laser's unless you use expensive coated paper.



XEROX XPRINT 4920 PLUS
Xerox fine-tuned the way true black is used in both monochrome and color images, so this color laser's text, gray-scale, and full-color prints all look crisper and truer than images from the unit's competition.

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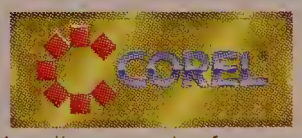

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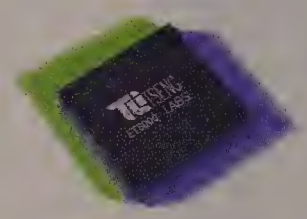

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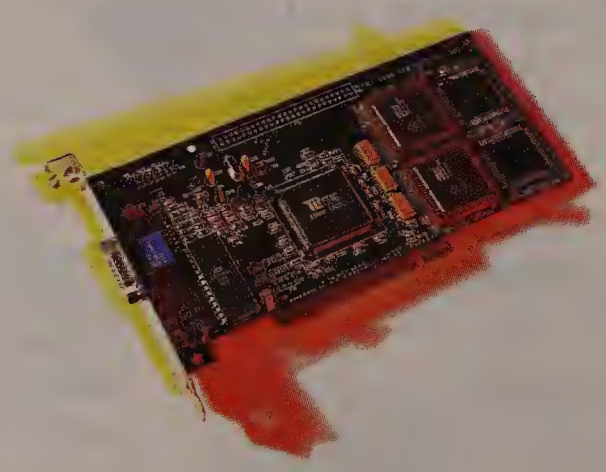

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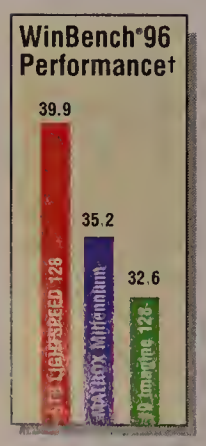

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PC WORLD

TOP 10 MONITORS

	17-INCH MONITORS	Month tested	Street price (5/31/96)	Overall rating	Quality of text/graphics	Comments	Reader service number
1	IBM P70 800/426-7255 http://www.pc.ibm.com	new	$899	84	very good/ very good	**FEATURES:** 15.9-inch viewable screen, .26mm Trinitron tube, up to 85-Hz refresh rate[1], Level 2b Plug and Play ready[2], three-year warranty, 24-hour daily toll-free support. **PROS/CONS:** Sharpest text and graphics detail of the bunch, easy-to-use on-screen menus; two extremely faint lines visible across screen, expensive.	–
2	Panasonic PanaSync S17 201/348-7000 http://www.panasonic.com	new	$699	84	very good/ very good	**FEATURES:** 15.7-inch viewable screen, .27mm dot pitch tube, up to 85-Hz refresh rate[1], Level 2b PnP ready, three-year warranty, 24-hour daily toll-free support. **PROS/CONS:** Low price for accurate text and graphics quality; on-screen menu icons difficult to decipher—frequent button pressing needed to adjust screen.	616
3	Continental Digiview 1709D 818/854-8288 http://www.digiview.com	new	$799	83	very good/ very good	**FEATURES:** 15.9-inch viewable screen, .25mm Diamondtron tube, up to 101-Hz refresh rate[1], Level 2b PnP ready, three-year warranty, 8-hour weekday toll-free support. **PROS/CONS:** Good price, words and pictures look very crisp, main control button looks odd but adjusting screen is easy; rear on/off switch is hard to reach.	617
4	Packard Bell 3020 SL 800/733-5858 http://www.packardbell.com	new	$660	82	very good/ very good	**FEATURES:** 15.7-inch viewable screen, .28mm dot pitch tube, up to 75-Hz refresh rate[1], Level 2b PnP ready, 24-hour daily toll-free support. **PROS/CONS:** Lowest price on chart, very sharp type and images; awkward four-button control panel, lacks reset and image tilt controls, only a one-year warranty if not purchased with a PC.	618
5	Samsung SyncMaster 17GLsi 818/365-8131 http://www.samsung.com	new	$910	80	very good/ satisfactory	**FEATURES:** 15.8-inch viewable screen, .26mm dot pitch tube, up to 105-Hz refresh rate[1], Level 2b PnP ready, three-year warranty, 24-hour daily toll-free support. **PROS/CONS:** Type looks crisp, easy-to-use controls, extensive on-screen menu includes a focus control to keep the picture sharp; ho-hum graphics, expensive.	619
6	Wyse Technologies WY-17PS 800/997-0014 http://www.wyse.com	new	$919	80	good/ very good	**FEATURES:** 15.9-inch viewable screen, .25mm Diamondtron tube, up to 101-Hz refresh rate[1], Level 2b PnP ready, three-year warranty, toll-free support 9 hours on weekdays. **PROS/CONS:** Detailed type and images, same controls as Continental; expensive, rear on/off switch is hard to reach.	620
7	ViewSonic PT770 909/869-7976 http://www.viewsonic.com	new	$899	80	very good/ good	**FEATURES:** 15.9-inch viewable screen, .25mm Diamondtron tube, up to 101-Hz refresh rate[1], Level 2b PnP ready, three-year warranty, 11-hour weekday toll-free support. **PROS/CONS:** Type is very sharp, vivid graphics, easy to adjust, color correction software; two faint lines visible across screen.	621
8	Dell UltraScan D1726T-HS 800/289-3355 http://www.dell.com	new	$799	80	good/ good	**FEATURES:** 15.7-inch viewable screen, .25mm Trinitron tube, up to 105-Hz refresh rate[1], Level 2b PnP ready, three-year warranty, 24-hour daily toll-free support. **PROS/CONS:** Crisp text and graphics, easy controls (press a button, and the appropriate adjustment gauge appears); two faint lines across screen, no degauss button.	622
9	Mitsubishi Diamond Scan 17HX 714/236-6352 http://www.mela-itg.com	new	$849	77	satisfactory/ satisfactory	**FEATURES:** 15.4-inch viewable screen, .26mm dot pitch tube, up to 105-Hz refresh rate[1], Level 2b PnP ready, color and image correction software, three-year warranty, 8.5-hour weekday toll-free support. **PROS/CONS:** Extensive on-screen menus, easily adjustable controls; letter and picture details look slightly fuzzy.	623
10	Sony Multiscan 17sell 800/352-7669 http://www.sel.sony.com	new	$1159	76	very good/ good	**FEATURES:** 15.7-inch viewable screen, .25mm Trinitron tube, up to 100-Hz refresh rate[1], Level 2b PnP ready, three-year warranty, 15 hours of daily toll-free support. **PROS/CONS:** Crisp text detail rivals the IBM's, bright graphics, intuitive on-screen controls; most expensive monitor on chart, two faint lines visible across picture.	624

Best Buy http://www.pcworld.com/t10monitors

STARTING THIS MONTH we're testing monitors with a greater variety of graphics and text screens. Of the 25 brand-new 17-inch models we saw, the IBM P70 displays the best-looking text and brightest graphics. Its on-screen menus are logical and work well in tandem with the control buttons. If you can live with less intuitive on-screen menus and a slightly smaller screen, your next best bet is Panasonic's PanaSync S17, which costs $200 less. For the full review, see page 147. ■

HOW WE TEST We use a ten-member jury to rate a monitor's text and graphics quality. We evaluate each unit on how well it can display typical business letters, spreadsheets, Web pages, and scanned images. The overall rating is based on text and graphics quality (25 percent each), features and ease of use (25 percent), price (20 percent), and service and support (5 percent). The best possible overall rating is 100. Data based on tests designed and conducted by the PC World Test Center. All rights reserved. For more information about all products in this table, circle reader service no. 901.

[1] Highest refresh rate at 1024 by 768 resolution. [2] Level 2b Plug and Play monitors and graphics cards can communicate bidirectionally. However, Windows 95 does not fully utilize monitor Plug and Play.

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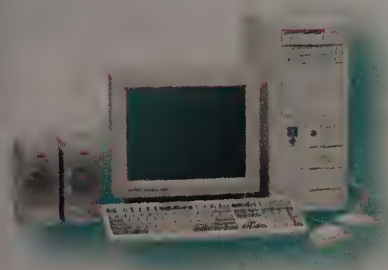

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PC WORLD

TOP 10 GRAPHICS BOARDS

	GRAPHICS BOARDS	Last reviewed	Street price (6/7/96)	Overall rating	PC WorldBench graphics score	Comments	Reader service number
1	Diamond Stealth 3D 2000XL 800/468-5846 http://www.diamondmm.com	new	$179	93	183 very good	**FEATURES:** 2M8 of EDO DRAM, 100-Hz refresh rate at 1024 by 768, 3-D acceleration, bundled games, Mediamatics MPEG software, DirectVideo, S3 Virge chip. **PROS/CONS:** Low-cost 3-D card performs like a board with costlier memory, good utilities, excellent MPEG playback; tech support can be hard to reach.	661
2	STB Lightspeed 128 888/234-8750 http://www.stb.com	Aug 96	$229	92	186 very good	**FEATURES:** 2.25M8 of MDRAM, 120-Hz refresh rate at 1024 by 76B, bilinear video interpolation, Xing MPEG software, DirectVideo, Tseng Labs ET6000 chip. **PROS/CONS:** Performs well in business and graphics programs, fast yet inexpensive, perfect AVI video playback, excellent MPEG, lifetime warranty; no 3-D acceleration.	662
3	Matrox MGA Millennium 800/361-1408 http://www.matrox.com	June 96	$269	91	184 very good	**FEATURES:** 2M8 of WRAM, 120-Hz refresh rate at 1024 by 768, 3-0 acceleration, optional MPEG and TV tuner cards, CompCore MPEG software, DirectVideo, Matrox MGA-2064W chip. **PROS/CONS:** Fast, high refresh rates, holds 8MB, superb AVI video; poor MPEG, version in PCs often slower than retail version.	663
4	STB Powergraph 64 Video 888/234-8750 http://www.stb.com	June 96	$139	91	175 good	**FEATURES:** 2MB of EDO DRAM, 120-Hz refresh rate at 1024 by 768, optional MPEG and TV tuner cards, Xing MPEG software, S3 Trio64V+ chip. **PROS/CONS:** Big price drop, good MPEG playback, lifetime warranty, toll-free support; not the best choice for image editing because it holds only 2MB of RAM.	664
5	ATI 3D Xpression 905/882-2600 http://www.atitech.ca	new	$199	89	174 good	**FEATURES:** 2M8 of EDO ORAM, 100-Hz refresh rate at 1024 by 768, 3-D acceleration, optional MPEG and TV tuner module, ATI MPEG software, ATI 3D Rage chip. **PROS/CONS:** Affordable all-in-one graphics board with 3-D functions, faster in Windows than ATI Video Xpression, good MPEG playback; not ideal for high resolutions.	665
6	Hercules Terminator 64/Video 800/532-0600 http://www.hercules.com	June 96	$179	86	172 good	**FEATURES:** 2M8 of EDO DRAM, 90-Hz refresh rate at 1024 by 768, optional MPEG and TV tuner cards, Xing MPEG software, S3 Trio64V+ chip. **PROS/CONS:** Low-cost board with extensive software utilities, good MPEG playback; performance good for many applications but not for complex, high-resolution graphics.	666
7	Paradise Pipeline 64 800/978-3079 http://www.paradisemmp.com	new	$129	85	168 satisfactory	**FEATURES:** 2MB of EDO DRAM, 75-Hz refresh rate at 1024 by 768, Mediamatics MPEG software, Philips 9710 chip. **PROS/CONS:** Cheap, no-nonsense board, intuitive software utilities, excellent MPEG playback; struggles at 16.8 million colors, low refresh rates can lead to annoying flicker at higher resolutions.	667
8	Diamond Stealth64 Video 2201TV 800/468-5846 http://www.diamondmm.com	July 96	$224	84	175 good	**FEATURES:** 2M8 of EDO DRAM, 100-Hz refresh rate at 1024 by 768, built-in TV tuner, optional MPEG card, Mediamatics MPEG software, S3 Trio64V+ chip. **PROS/CONS:** TV on your PC without compromising Windows performance, excellent MPEG playback; not suited for complex graphics, readers tell us it's hard to get tech support.	668
9	Diamond Stealth64 Video 3200 800/468-5846 http://www.diamondmm.com	June 96	$269	84	176 good	**FEATURES:** 2M8 of VRAM, 120-Hz refresh rate at 1024 by 768, CompCore MPEG software, S3 Vision968 chip. **PROS/CONS:** One-time top VRAM board now runs well with new Win 95 driver, good MPEG playback; adequate performance if you dabble in graphics apps, but you can't upgrade the memory.	669
10	Hercules Terminator Professional 800/532-0600 http://www.hercules.com	June 96	$279	84	178 good	**FEATURES:** 2MB of VRAM, 120-Hz refresh rate at 1024 by 76B, Xing MPEG software, S3 Vision96B chip. **PROS/CONS:** Good for graphics pros, who might opt for an extra 2MB to display more colors, supports high refresh rates to reduce flicker, good MPEG playback; a bit pricey, poor documentation.	670

Best Buy Windows 95-certified Plug and Play http://www.pcworld.com/t10graphics

GET READY TO ENTER THAT THIRD DIMENSION: Our new leader, Diamond's Stealth 3D 2000XL, and the fifth-place ATI 3D Xpression are both good, inexpensive boards for viewing basic 3-D. The 2000XL is the better card for business applications. Our third newcomer, the Paradise Pipeline 64, is not particularly fast or flashy, but it's a good upgrade board if your current card is ancient and you work mainly with basic Windows programs. Too slow to make the chart: ATI's Video Xpression, and two gaming boards with built-in sound—Diamond's Edge 3D 2200XL and Jazz's 3D Magic. ■

HOW WE TEST We tested boards under Win 95 with PC WorldBench 1.0 at B00 by 600 resolution at 16.B million colors (reported here) and at 1024 by 768 at 65,536 colors, on a Dell Dimension XPS P133c with 16MB of EDO RAM and 256K of pipeline-burst cache. Overall rating is based on performance (40 percent), features (30 percent), price (20 percent), and support policies (10 percent). For all ratings, higher is better. Data based on tests designed and conducted by the PC World Test Center. All rights reserved. For more information about all products in this table, circle reader service no. 912.

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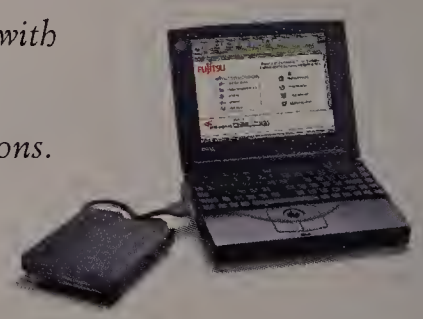

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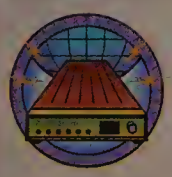
PC WORLD

TOP 10 MODEMS

	EXTERNAL MODEMS	Month tested	Street price (6/15/96)	Overall rating	Average time to send five file types (min:sec)	Comments	Reader service number
1	Motorola Lifestyle 28.8 800/566-3266 http://www.mot.com/mims/isg/	Mar 96	$200	89	4:12	**FEATURES:** Fax Class 1 only, stores two phone numbers for callback, password protection, Caller ID, QuickLink II fax/data software, five-year warranty, toll-free support, built-in help screens. **PROS/CONS:** Best performer on chart, attractive price, good support; feature set is minimal.	640
2	Microcom DeskPorte 28.8P 800/822-8224 http://www.microcom.com	Apr 96	$190	87	4:36	**FEATURES:** V.FC, MNP-10, Fax Class 1 and 2.0 (standard), serial cable, FlashROM, parallel port connection, callback, password protection, Faxworks 3.0, five-year warranty, overnight replacement. **PROS/CONS:** Very good performer, low price, great feature set; support policies are average.	641
3	U.S. Robotics Sportster 28.8 V.34 Faxmodem 800/342-5877 http://www.usr.com	Aug 96	$199	86	4:33	**FEATURES:** 33.6-kbps connectivity, V.FC, Fax Class 1 and 2.0 (standard), must replace chip to upgrade, manual volume control, QuickLink II fax/data package, five-year warranty. **PROS/CONS:** Very good performance, affordable, light and small; basic support policies, manual could be clearer.	642
4	Cardinal Technologies MVP288XV 800/775-0899 http://www.cardtech.com	May 96	$185	86	4:44	**FEATURES:** V.FC, MNP-10EC, Fax Class 1 and 2 (protocol), FlashROM, manual volume control, voice mail, Radish VoiceView, Faxworks 3.0 With Voice, lifetime warranty. **PROS/CONS:** Great price for this feature-laden unit; so-so performance, $25 shipping and handling fee for each return after one year.	643
5	Zoom V.34X Fax/Data Modem 800/631-3116 http://www.zoomtel.com	July 96	$169	86	4:43	**FEATURES:** V.FC, MNP-10EC, Fax Class 1 and 2 (protocol), Winfax Lite and Comit for Windows Lite, seven-year warranty, 14.5 hours of support per weekday, overnight replacement. **PROS/CONS:** One of the cheapest external modems around, very good support policies; a little sparse on features.	644
	PC CARD MODEMS						
1	Zoom V.34C 800/631-3116 http://www.zoomtel.com	Mar 96	$199	88	4:55	**FEATURES:** MNP-10EC, Fax Class 1 and 2 (protocol), FlashROM, direct connect to cellular phones, Winfax Lite and Comit for Windows Lite, two-year warranty, 14.5 hours of support per weekday, overnight replacement. **PROS/CONS:** One of the cheapest modems on chart; installation was troublesome.	645
2	Hayes Optima 288 V.34+Fax for PCMCIA With EZjack 770/840-9200 http://www.hayes.com	Feb 96	$269	87	4:32	**FEATURES:** V.FC, Fax Class 1 and 2 (protocol), FlashROM, built-in phone jack, 230-kbps modem-to-PC speed, distinctive ring, callback, Caller ID, SmartCom, five-year warranty, toll-free support. **PROS/CONS:** Excellent performer, feature-packed, great support policies; price is a little high.	646
3	Megahertz XJ4288 800/527-8677 http://www.megahertz.com	July 96	$300	87	4:50	**FEATURES:** V.FC, MNP-10EC, Fax Class 1 and 2 (protocol), FlashROM, built-in phone jack, 230-kbps modem-to-PC speed, direct connect to cellular phones, digital line alert, five-year warranty. **PROS/CONS:** Feature-rich, excellent manuals, flawless installation; priciest unit on chart.	647
4	TDK Systems DF2814 800/999-4835 http://www.tdksystems.com	May 96	$199	86	4:37	**FEATURES:** V.FC, MNP-10EC, Fax Class 1, FlashROM, 300-kbps modem-to-PC speed, direct connection to cellular phones, callback, QuickLink II, five-year warranty, toll-free support. **PROS/CONS:** Very good performer, great price, good support policies; installation required a support call.	648
5	MultiTech Systems MultiModem LT 800/328-9717 http://www.multitech.com	Apr 96	$249	86	5:20	**FEATURES:** V.32ter, Fax Class 2 (protocol), FlashROM, phone cable has two jacks, MultiExpress/MultiExpressFax software, five-year warranty, toll-free support, overnight replacement. **PROS/CONS:** Competitive support policies, installation went off without a hitch; slowest performer on chart.	649

Best Buy Windows 95-certified Plug and Play http://www.pcworld.com/t10modems



SPEED AND AFFORDABILITY are the highlights of Motorola's Lifestyle 28.8 and Zoom's V.34C, which remain the external and PC Card modem Best Buys for another month. The Lifestyle also offers toll-free tech support and a decent five-year warranty. Zoom's tech support isn't toll-free, but it is available 14.5 hours per weekday and 8 hours a day on weekends—some of the longest hours around. TDK joins Zoom this month in the under-$200 club with a $40 price drop. ■

HOW WE TEST We tested throughputs for a pair of identical modems on a simulated public-service telephone network using five file types and 55 line conditions. The overall rating is based on price (3 to 20 percent), features and ease of use (32 to 38 percent), performance (40 to 46 percent), and support (8 to 13 percent). Data based on tests designed and conducted by the PC World Test Center. All rights reserved. For more information about all products in this table, circle reader service no. 904.

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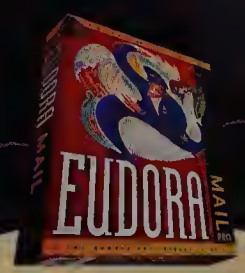

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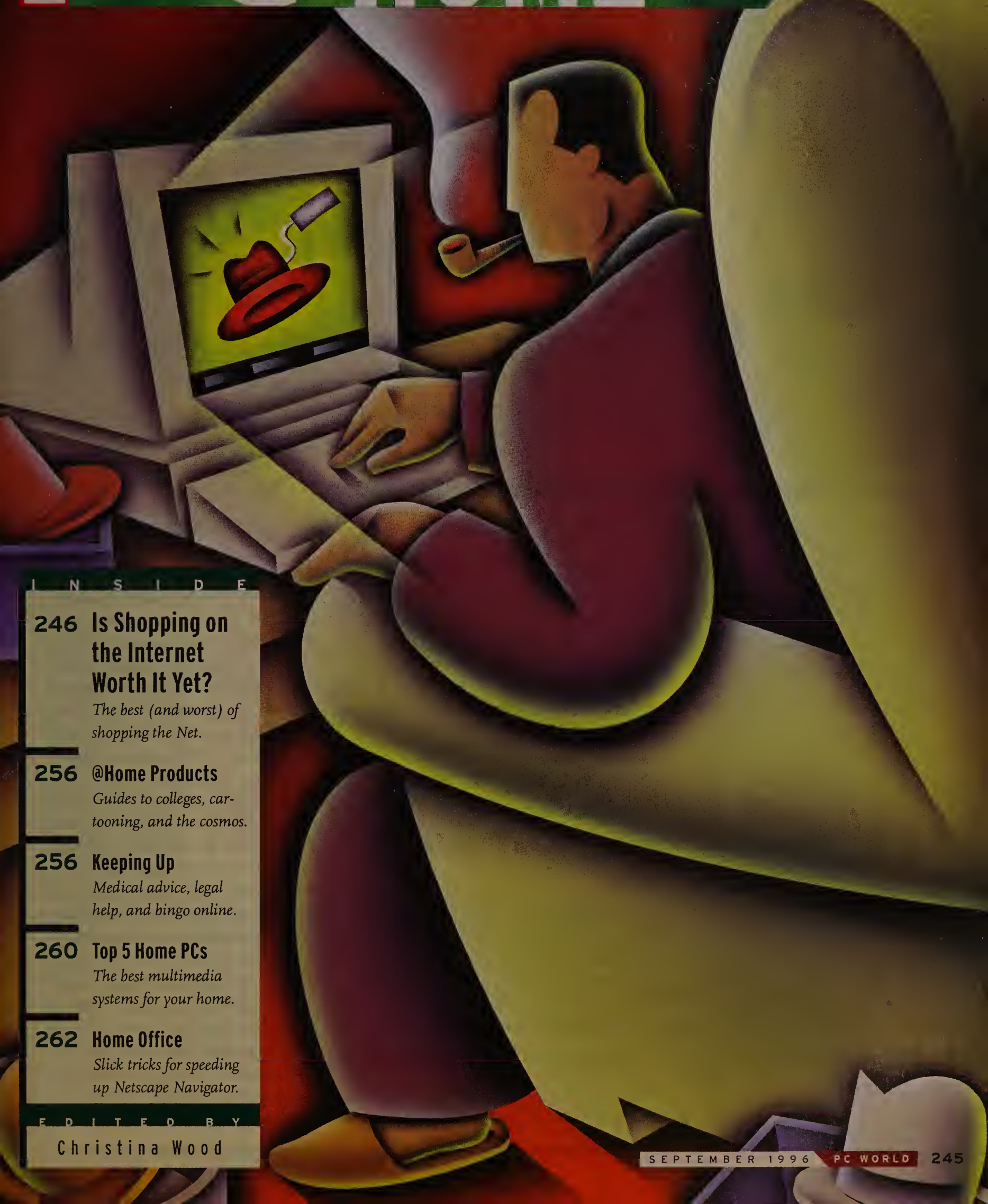

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EDITED BY

Christina Wood

Is Shopping on the Internet Worth It Yet?

You can buy just about anything online and at great prices. **So what's the catch?** PC World went on a shopping spree to find out.

BY ROBERTA FURGER

THERE HAS TO BE A BETTER WAY TO SHOP.

Anyone who has ever been caught in the gridlock of a crowded shopping mall parking lot knows it. Anyone who has been stuck listening to an endlessly repeating "your call is important to us; please continue holding" has wished for it.

Online shopping just might free us from those frustrations. Its proponents promise incredible selection, great prices, and no crowds or waiting. Sounds appealing, to be sure. But we were still skeptical. For all the mountains of goodies available online, you can't try on the clothes, you can't browse the books, you can't see the plants, and you can't handle the merchandise.

Does the convenience of online shopping make it worthwhile? Armed with a fistful of credit cards, *PC World* editors went cybershopping to find out. We took our cue from the online services—which are scrambling to reinvent themselves as Web-based information carriers—and did most of our shopping on the Internet, though we also checked out the selections available on America Online, CompuServe, and Prodigy.

While you can buy anything from amino acid tablets to xylophones online, we focused on more common products and services: books and music CDs, flowers and gifts, computer hardware and software, plants and gardening supplies—even automobiles (see "Kicking Tires Online"). We purchased from a wide range of cybershops—tried-and-true merchants like Smith & Hawken and Egghead as well as Internet upstarts such as Music Blvd. and the Santa Barbara Heirloom Seedling Nursery. We even tried out a new grocery shopping service to see if life's biggest shopping hassle could be automated by computer (see "The Online Supermarket"). Our goal: to scope out the selection, compare prices, and test the customer service offered by online merchants.

Each category offers a staggering array of vendors, from those with niche merchandise to giant online superstores with vast and varied inventories.

ILLUSTRATIONS BY JEFF KOEGEL

A query on Infoseek—a major World Wide Web search site—for "book stores" returned a daunting 9800 possibilities, while a search for "music stores" yielded a mind-boggling 107,000 URLs. But start checking out the sites themselves and you'll soon discover that those numbers are misleading: Many sites consist of nothing more than advertising, and others belong to obscure vendors with few products and questionable policies.

There are some terrific online merchants, but be prepared to spend time—a *lot* of time—seeking them out. You're likely to encounter many duds before you discover the ones that combine low prices, attractive selections, and reliable customer service. And don't be surprised if a gem you find on Tuesday has vanished by Thursday. Many small merchants—and some larger ones—are having trouble keeping their sites up and running consistently.

Faced with the preponderance of small, unknown shops on the Web, you may be tempted to fall back on the known players. Unfortunately, while that may be the quick and easy way to go, it doesn't always get you the best price, selection, or customer service, as we discovered.

Customer Service? Don't Count on It

THE BEST MAIL-ORDER COMPANIES excel at customer service. They answer their phones quickly, notify you immediately of back-ordered products, and don't gouge you on shipping charges. Online merchants should be just as responsive.

But many aren't. A few examples: We ordered an 8MB SIMM from Internet Shopping Network (http://www.internet.net). The package arrived on schedule, but it came from an unfamiliar company called MicroTech and contained no documentation or invoice. Repeated e-mail messages to Internet Shopping Network's customer service department went unanswered, so we sent the product back and contacted our credit card company to have the charge removed. The music CD that we ordered from 1-800MusicNow (http://www.1800musicnow.mci.com) was not shrink-wrapped. When we explained the problem to a customer service rep, we were all but accused of lying and were told to pay the return freight to send the CD back. We kept the CD, but you can bet we won't shop there again.

Questions that vendors can easily answer when you buy over the phone become much harder to resolve when you order from the World Wide Web. Online companies rarely note when items are back-ordered, so you have to wait for a follow-up e-mail or phone message indicating when the order will be shipped. The same is true for final billing information: Few online merchants automatically compute sales tax, shipping charges, and product pricing.

Order processing isn't necessarily a real-time proposition, either. For example, we ordered some make-your-own stepping-stones from Eddie Bauer's America Online site (keyword Eddie Bauer) and followed up with a phone call to find out when the items would be shipped. The customer service rep ▶

couldn't tell us, though, since the order hadn't yet been retrieved from the AOL system and entered into Eddie Bauer's order entry system. The lesson: Ordering online doesn't necessarily speed up an order. So if you need your merchandise in a hurry, use the phone.

But if you don't mind some bumpy roads along the way, there are bargains to be found online. Following is a list of the sites we felt offered competitive pricing and broad selection. They aren't perfect, but are good examples of what you can expect when you shop online.

Compact Discs: From Amadeus to ZZ Top

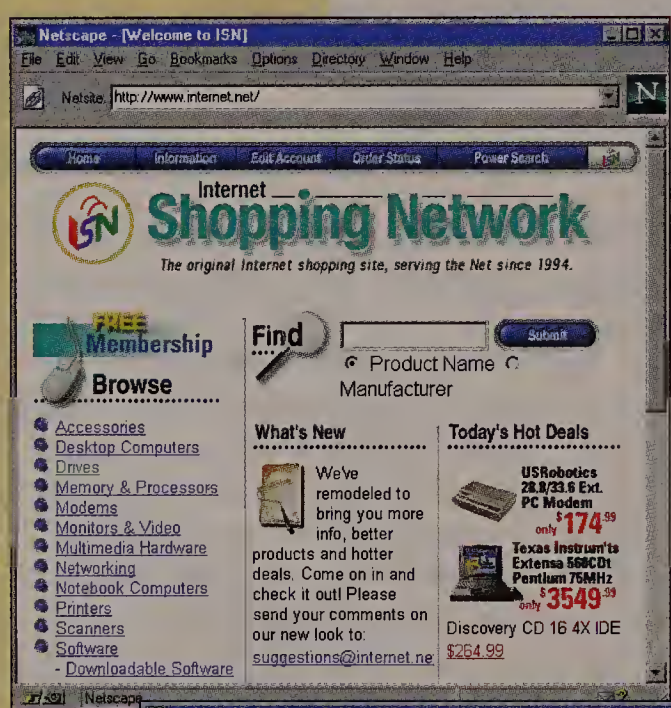
DOZENS OF MUSIC STORES operate online, and many supply sound bytes so you can sample a new or unknown artist before making a purchase. Title selection can range from a few small-edition cult items to thousands of CDs from every musical genre. At $3 to $4 off list price, CDs from online outlets generally cost about what you'd pay at a chain record store. Of course, you have to pay for shipping, too—generally around $2 to $5 per shipment.

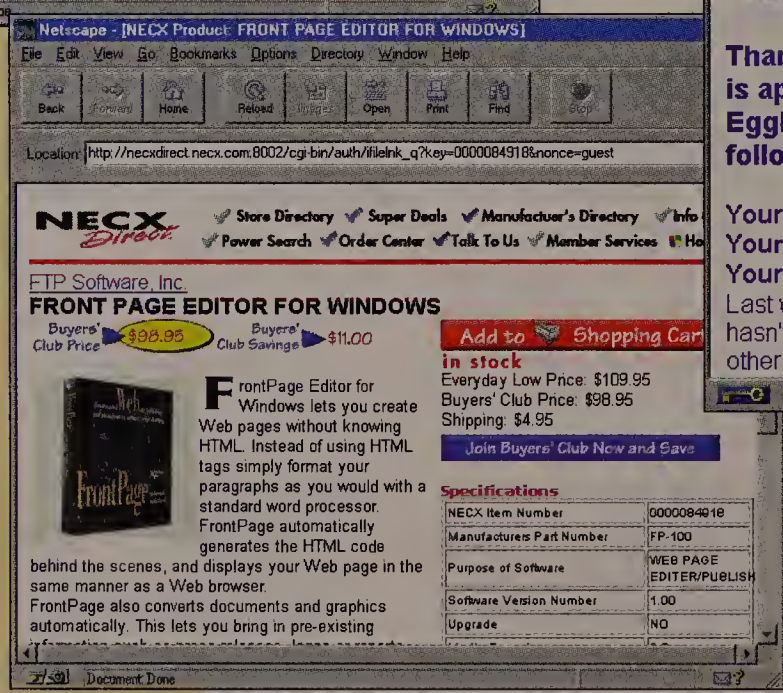
◆ CDWORLD (http://www.cdworld.com)
This site carries a whopping 100,000 titles—all discounted $2 to $4 off list—and you can search them by artist, title, label, or genre. Highlighted CDs feature cover art, song selections, and sample tracks for downloading. The site accepts credit cards and sends quick e-mail responses indicating total charges. CDworld offers a pleasant shopping environment as well as conscientious customer service.

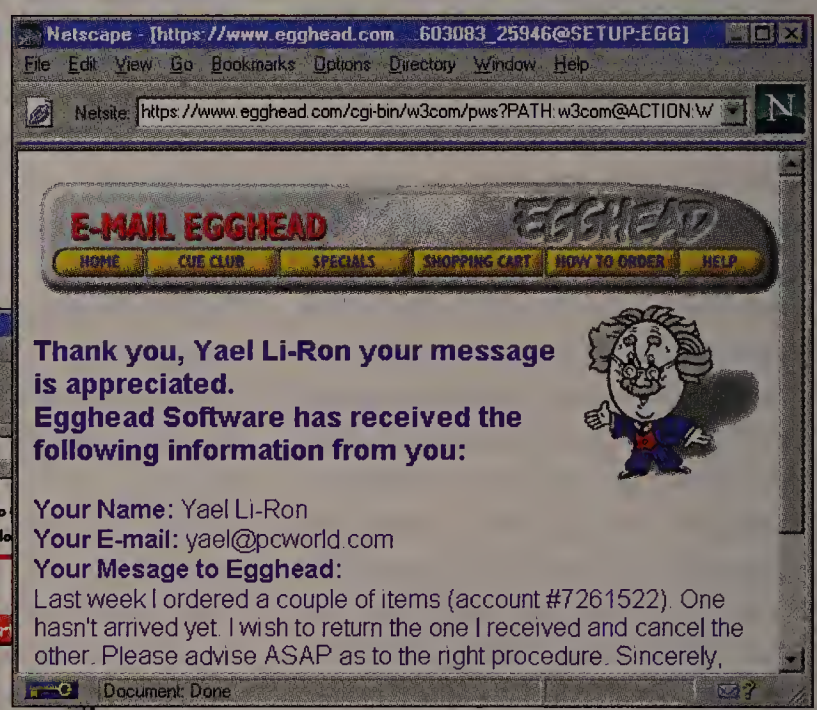
◆ MUSIC BLVD. (http://www.musicblvd.com)
A whopping 150,000 currently available titles are available on this site. Music Blvd. boasts 24-hour shopping, seven days a week, and accepts all major credit cards. You register once in a secure site, and your credit card number need never be entered again. Opened CDs can be returned within 30 days of purchase. You can search by music category, then by artist or album title. Album covers are displayed along with song selections and lengths. Another nice feature: Music Blvd. suggests new artists, based on CDs you've listened to or purchased. This feature, together with the attentive customer service, will have us shopping at Music Blvd. again.

◆ 1-800MUSICNOW (http://www.1800musicnow.mci.com)
You can listen to this site's huge selection of 30-second album track samples. But for that reason, 1-800 MusicNow doesn't let you return discs that are not physically defective. Given the aforementioned hassle with our order and a snafu with a second order, we won't be doing any more shopping here. Still, it's a great place to listen to new music before buying the CDs elsewhere.

◆ TOWER RECORDS ON AMERICA ONLINE (keyword tower)
This is the only site on the online services that really stands out. Known for its chain of retail shops around the globe, Tower's AOL store features some 150,000 CD and cassette titles, at the same prices found in its stores. Sale prices noted in Tower's monthly *Pulse* magazine are honored online, though not changing weekly store specials. The AOL site lacks sound clip previews, ▶







A NEW FORM OF WINDOW SHOPPING: When you shop online, you point and click, type in a query, and scroll through Web sites such as Internet Shopping Network (top left) and NECX Direct (right). Have a complaint? E-mail it to the merchant. Some, like Egghead (above), will confirm your message instantly, but actual replies take longer.

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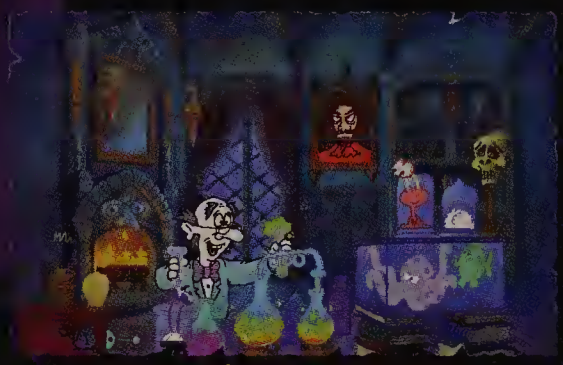

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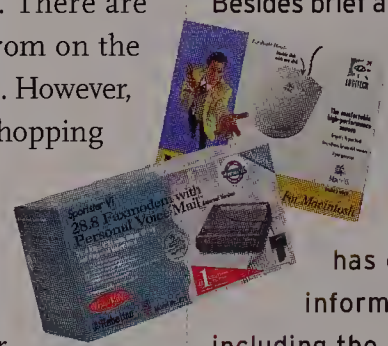
but you can view album covers for each title. The shipping surcharge is a flat $4.25 per order. Tower was putting together a Web site store as we went to press.

PCs, Peripherals, and More

BUYING HARDWARE AND SOFTWARE online should be faster and easier than going to your local superstore or ordering products over the phone. As with books and music CDs for sale online, often there are no images to look at, so the absence of high-quality photos does not really matter. Once you've done your research and decided on a product, you can devote your attention to comparing price and service options. There are plenty of sites to choose from on the Web and the online services. However, we found CompuServe's shopping interface too tedious (all stores use the same one), and on all the commercial services, the pricing was not competitive with either mail-order sales or the deals available on most Web sites. And even the Web site merchants do not seem all that competitive with their retail or mail-order counterparts. Here's a sampling of what we found.



◆ INTERNET SHOPPING NETWORK (http://internet.net)
Check out this site for an unbeatable combination: a huge selection of PC hardware and software at very competitive prices. ISN isn't perfect, though. The customer service staff is slow to respond to inquiries and started paying attention to our questions only when we identified ourselves as *PC World* shoppers. We ordered a NEC Multi-Spin 4X4 CD-ROM drive and the 8MB SIMM mentioned earlier, which we ultimately returned. The customer service difficulties might be the result of some technical problems with the site. Let's hope ISN squares those away fast. Slow service is the only real blemish that we found here.

◆ EGGHEAD (http://www.egghead.com)
This disappointing site is difficult to navigate, many products are not competitively priced, and the customer service leaves much to be desired. We ordered an EIDE controller and an I/O card and asked for rush delivery. The EIDE controller arrived on schedule, but a faded invoice indicated that the I/O card was back-ordered. We e-mailed the customer service department asking them to cancel the order. Despite our cancellation, the I/O arrived two days later. Only after repeated e-mail messages and phone calls did we get a credit.

◆ NECX (http://www.necx.com)
More than 1000 companies offer 25,000 hardware and software products on this site. All the big brands—and a lot of the smaller ones—are represented. Pricing is competitive with retail stores and mail-order companies. But NECX really shines when it comes to providing information. Besides brief articles authored in-house on how to buy specific items such as modems or printers, the site features short write-ups on each of the products sold. And NECX has one extra goodie: It offers information about each vendor, including the company's name, address, phone number, and links to its home page.

◆ CYBERIAN OUTPOST (http://www.cybout.com/cyberian.html)
This online merchant has an international feel. Click a flag to read customer service information in that country's language, including Japanese, German, and Spanish. Tracking your order is easy—just type in the order number to get the status. But Cyberian Outpost isn't perfect: It offers a money-back guarantee only on products whose manufacturers provide that protection. And although it has a great selection of kids' educational and entertainment titles, some major hardware vendors—including Compaq and Dell—are not represented.

◆ PC Zone (http://www2.pcy.mci.net/marketplace/PCZone/index.html)
This site is the mail-order merchant's Web counterpart. The PC Zone site is still under construction, so you probably won't find a huge selection available. When we stopped by, there were about 3000 products to choose from—far fewer than at other sites. The policies aren't as generous, either: PC Zone doesn't provide a money-back guarantee or price protection.

Tips for Shopping by Modem

1
Always pay with a credit card. That way you'll still have recourse to the bank if the order gets botched.

2
Doing last-minute shopping? Make sure that the orders you submit are received in real time and that the delivery date is guaranteed. Otherwise, order by phone.

3
If an online merchant has not verified your order by return e-mail within 12 hours, call to see whether the company got your order. Always scrutinize the merchant's customer service policies (returns, refunds, shipping fees) before finalizing an order.

4
Print or save the page that lists your order, the final price, and other information.

5
Visit a site several times before placing an order. If you frequently have trouble accessing a site, order elsewhere.

MICHAEL S. LASKY

Books: Reading Between the Lines

THERE ARE DOZENS of bookstore sites online—from mammoth superstores selling just about every title in print to smaller boutiques specializing in hard-to-find books or niche subject areas. When we did our shopping, the biggest names in the retail book business had established ▶

ILLUSTRATION BY JEFF KOEGEL

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only a limited presence in the online world: The Web site for Borders, the growing national book and music store, was under construction but should be accepting online orders by the time you read this. None of the other major chains—such as Barnes & Noble, Waldenbooks, or Crown Books—had any Web presence at all. But a few good sites online do offer selection and convenience, making this a time-saving way to keep up on your reading.

◆ AMAZON.COM (http://www.amazon. com)

This is hands-down the best place to hunt for books online. There are more than a million titles available, and most titles you order arrive within three days. Amazon.com features attractive, clean screens; some include scanned book covers. You can search for books using more than 20 subject categories, or by author, title, or keyword. All books are discounted at least 10 percent (20 and 30 percent for best-sellers), and customer service is first-rate. Of the two books we purchased, one was back-ordered (information we were given when we placed the order and again an hour later in a follow-up e-mail message); the in-stock book arrived three days after we ordered. A couple of days later, we sent an e-mail message asking Amazon.com to cancel shipment of the back-ordered book, and we received e-mail confirmation within five minutes. It's too bad all Internet shopping sites aren't run this well.

◆ AMERICA ONLINE'S READ USA (keyword: ReadUSA)

This AOL merchant features a text-based catalog (no jacket covers pictured) of a broad selection of books, almost all discounted 20 percent—national best-sellers are 35 percent off. Shipping and handling tops out at $5.95 per order. Searching for a particular book is difficult, however, since you're forced to do the author, title, and subject search all on one query line. Once we found what we wanted we placed our order; the shipment arrived ten days later. Pricing is all right, but on the whole Read USA was not a particularly friendly place to shop.

◆ BOOKSITE (http://www.booksite.com)

Stop by this Web merchant for everything from top best-sellers to obscure volumes, 200,000 titles in all. BookSite is the Internet alter ego of Rutherford's Book Shoppe, a full-service bookstore in Columbus, Ohio. Navigation is easy, and the site makes attractive use of book-cover graphics. But searching for a specific book is a chore: Instead of providing separate search fields for title, author, and subject, the search feature offers only one query line. This cumbersome setup yields every single book with an author or title that contains the search string. Still, BookSite has redeeming qualities: You get quick e-mail confirmation of orders; shipping is $3.85 per order for Priority Mail or ground UPS. Two special services might make you rely on this site: BookSite's Personal Reminder

Kicking Tires Online

You wouldn't want to actually buy a new car online (there are no test drives on *this* highway), but cyberspace is full of great places to *research* a car purchase. And that's important, because buying a new car is like scuba diving in industrial waste: You need to know exactly what you're getting into.

Most of the online services follow the same pattern: You set the criteria for the type of car you want—say, a station wagon for less than $15,000, with dual airbags—and the service supplies a list of prospects, complete with important statistics and maybe pictures and reviews. Alas, without getting something in return, none of the online services will give you the dealer invoice price—the amount dealers pay the manufacturer for a car, and a valuable reference figure to have when you bargain.

There are scads of auto buying services online. Here are the ones that impressed me most.

COMMERCIAL SERVICES

CompuServe has a crankcase full of forums for potential car buyers. There's Auto-By-Tel (go autobytel), the Automobile Information Center (go ai), Consumer Reports (go consumer), and AutoVantage (go AV). (Consumer Reports and AutoVantage are also available on America Online, with the keywords consumer and autovantage.) But the only standout here is the AutoNet New Car Showroom (go newcar).

If you know what you want, AutoNet is the cheapest way to get a dealer invoice price. Select *Get Reports: By Vehicle Make and Model*, then pick a make and a model; in the next list select the model's *Data Sheet*. You'll get a table of statistics, and $1.50 will be charged to your CompuServe account.

INTERNET AUTOS

I found two services on the Web worth mentioning: AutoSite and Edmund's Automobile Buyer's Guides. If we go by a strict definition of online information—through your modem and into your life—AutoSite (http://www.autosite.com) is your best bet. The interface is clumsy, but not hard to figure out. And once you get the information, AutoSite furnishes illuminating explanations. If you're wondering what the blazes a destination charge is, just click the term for a definition. This feature is an absolute must if you're not an automotive expert.

Service lets you enter five dates to remember (such as birthdays and anniversaries) and sends you an e-mail reminder one week before each date. The Eyes service notifies you by e-mail when new books in interest areas you have selected are released.

Flower Power

IF YOU SEND A LOT OF FLOWERS to out-of-town relatives, friends, and business associates, you know how hard it is to find florists you can trust to send pretty arrangements on time. Usually you just hand over your credit card information and hope for the best. Well, sending flowers online takes some of the mystery—and worry—out of the process. On the best sites, you can preview large, clear photos of plants or arrangements before placing your order.

The trouble is, not all sites have accurate or even enticing photos, or give you all the information you'd like about the type of flowers included or the dimensions of an arrangement. Delivery can also be problematic. Some online florists include a notepad where you can record special instructions, such as delivery time. But others require you to call them if the order needs special attention. One word of advice when using any of these services: Call or send e-mail to confirm that delivery was on schedule.

FLOWERS ONLINE: BLOSSOM OR BUST?

WHAT YOU SEE IS WHAT YOU GET? The pictures at all florist sites show what you might get. The flowers on the left are what we ordered. What arrived is on the right.

◆ FLOWERLINK
(http://flowerlink.com/ html/menu.html)
This site is a great resource for finding local florists throughout the country. It's much better, in fact, than the similar FTD Web site. We found names and phone numbers for florists in cities as diverse as Placerville, California, and Winetka, Illinois. If the florist suggested has its own home page, you'll get a direct link to that site.

◆ 1-800-FLOWERS
(http://www.1800 flowers.com)
One of the first online florists, 1-800-Flowers still has one of the best selections and displays. In addition to maintaining a Web site, it's also available on AOL and Prodigy. You can review arrangements by occasion (birthday bouquets, get-well arrangements), and most are accompanied by photos. The first time we ordered, the entire process worked without a hitch, and the flowers were delivered on the date requested. The second order was never delivered. Unfortunately, we didn't discover this until a few days after the expected delivery date, due to conflicting voice mail and e-mail messages about the order. Eventually we received a $10 gift certificate for our trouble. Despite the mix-up, we would probably shop here again: They made up for the problems we had, and they have a great selection of flowers.

◆ PLAZA FLOWERS
(http://www.pflorist .com)
This Pennsylvania florist works with a network of local florists throughout the United States and offers a beautiful assortment of unusual flowers and exotic plants. The flowers aren't cheap—we spent nearly $54 on a medium-size arrangement—but the gushing thanks we got from the recipient convinced us it was worth the money. Although you place the order online, you don't enter any credit card information. Instead, a company representative calls you and takes payment information over the phone. We placed our order three days before we wanted the flowers sent and specified a date and time for the delivery. But as with our second 1-800-Flowers order, the arrangement didn't arrive on schedule. When we called the assigned store to complain, the staff told us the local florist had missed the order. After apologizing profusely, the manager offered to cancel the order, to send a larger arrangement for the same price, or to send a second arrangement or plant at no charge. We opted for the last choice.

Garden Supplies: Still Not a Growth Industry

COMPARED WITH BUYING BOOKS and CDs, shopping for gardening supplies online is still downright prehis- ▶

AutoSite's free information is worth every penny you pay for it. But to get any real value beyond the most basic facts, you have to register as a site member. Enrollment costs $9.95 for 30 days, which is probably all the time you need to choose a car. Once you've paid, you can log on with a password, and you'll have access to table after table of detailed information, including as many of those all-important dealer invoice prices as you can download.

But $9.95 buys you much more at the Edmund's Automobile Buyer's Guides site (http://www.edmund.com), even though the site itself has little to offer. It is one of the few places where you can order Edmund's Buyer's Guide: New Cars, a $9.95 CD-ROM that blows away the online sources, as well as other discs. Look up a car, and you get four tables of data, a list of options that are calculated into the price as you check them off, and a review. Edmund's Buyer's Guide isn't a fancy multimedia toy: The disc contains little video, and it doesn't come in a fancy box—but it has all the information you need, including that precious dealer price, and it's fast and easy to use.

LINCOLN SPECTOR

toric. We scoured AOL, CompuServe, and Prodigy but couldn't find any merchants selling plants, seeds, or tools. The selection is no better on the Web. Most sites are difficult to find, have minimal selection, and provide even fewer photos. We did find a few products worth purchasing online, but all in all it's much easier just to call a toll-free number and request a catalog.

◆ SANTA BARBARA HEIRLOOM SEEDLING NURSERY (http://www.silc om.com/heirloom)

Try this site for an extensive selection of herb and vegetable seeds and plants. But be warned: Once you factor in the exorbitant shipping costs, you end up paying handsomely. We ultimately purchased an assortment of herb and vegetable seedlings. The 24 plants cost us about $70, but the shipping tacked on a whopping $21.80. And the customer service was spotty: We received a prompt e-mail message alerting us to a problem with our order—but when we later sent a return e-mail asking about the delivery date, we received no reply. The order arrived on schedule.

◆ SMITH & HAWKEN (http://www.smith-hawken.com)

The premier gardening equipment supplier has its own Web site, but you won't find much there. The limited selection is accompanied by fuzzy photos—a problem if you're thinking of ordering one of their $800 garden chairs, for example. We ordered "Camomile Lawn" seeds, a pruner, and a hand weeder. All three items were in stock, and we received our order in about a week. At the time we made our purchase, we could browse the site, but had to call orders in to S&H's 800 line. There's now support for online transactions using all major credit cards.

It Ain't Gonna Be Easy

IS ONLINE SHOPPING worth the trouble? It depends on what you're looking for. If you want to buy books, music CDs, or PC hardware and software, you can save a lot of time—and some money—ordering online. And if you're shopping for a car, there's no faster way to go from intimidated to armed-for-fierce-negotiating than by spending a few hours online. But for most other products, retail stores and mail-order catalogs are preferable.

If you do decide to fire up your modem instead of your car, expect to invest some time pinpointing merchants that provide the service and selection you need. Then cross your fingers and hope the URL is still functioning the next time you want to place an order. ■

Roberta Furger is a contributing editor for PC World. *Michael S. Lasky and Lincoln Spector are senior associate editors. Senior associate editor Yael Li-Ron and freelance writer Leslie Crawford contributed to this article.*

The Online Supermarket

No matter what the day or time, it seems my local supermarket is always crowded. As much as I like food, I dread shopping for it. So Peapod, a national online grocery and drugstore shopping and delivery service, seemed to offer the perfect solution. Why not let their minions cruise the aisles, fight the crowds, and deliver the goods to my door while I channel surf?

Already established in Chicago and the San Francisco Bay Area, the service will be expanding later this year to Boston and Columbus. I downloaded the free Peapod software from its Web site (http://www.peapod.com) and put it to the test.

First, I dialed in to a local access number, selected my preferred supermarket, and browsed categories such as produce, frozen, and household products. Clicking a category got me listings of the items in stock, including package size and price. Peapod even noted when items were on sale in the market that was nearest to my house.

I ordered some potato chips (would they be uncrushed?), a frozen carrot cake (would it still be frozen?), yogurt and a package of refrigerated sliced turkey (would they be cold?), and a cantaloupe and honeydew melon (would they be ripe and unbruised?).

The cost of having Peapod push the shopping cart and deliver the goods to my door was $6.95 plus 5 percent of the order total. I was allowed to arrange for delivery—within a 90-minute range—from as soon as three hours after the time I placed my order to any time later in the week. Payment is by credit card in advance or check upon delivery.

Two items weren't available, so I got rain checks. Everything else arrived in good shape, except the frozen cake (defrosted) and melons (not quite ripe).

The order came in the first half-hour of the 90-minute time slot I had designated.

On the whole, I enjoyed the experience. I probably won't order produce again—I prefer to hand-select it anyway—but for other groceries, this is definitely a convenient way to shop. *—M.L.*

CURE FOR SHOPPING CART BLUES: Using Peapod's online grocery shopping service, you order by product category. Your packages are delivered at times you designate.

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College Smarts, Easy Arts, the Sea and the Stars

SCHOOL DAZE

APPLYING TO COLLEGE is no trivial task. It's confusing to select a school and major, find the tuition money, and keep track of the process. A new CD-ROM, **CollegeEdge**, can help. First it interviewed me on my career goals, college criteria, and interests. It told me I should consider studying linguistics, computer science, or home economics. Linguistics sounded interesting, so I looked for a school that offers a degree in the field and a really good tan. After another lengthy interview I was finally presented with the one college that met my needs: Hawaii Pacific University. I was able to read all about the demographics of the student body at HPU, but there were no photos or video clips to give me a feel for the campus. The disc does offer a universal college application and a scheduler to keep track of the whole process. But with its awkward interface and lack of multimedia, CollegeEdge fails to make the grade. —*Yael Li-Ron*

CollegeEdge

Grade: **C-**; STREET PRICE: $49; SNAP Technologies, 415/778-6262

READER SERVICE NO. 673

ART FROM DOODLES

IF ALL THE DOODLING that goes on in staff meetings is any evidence, many people would love to be able to sketch a quick cartoon. Take a few lessons from **How to Draw Cartoons**, based on the book *Everything You Wanted To Know About Cartooning But Were Afraid To Draw*, and you might find those meetings a lot more fun. This guide takes you step by step through the process of drawing simple cartoon characters. Like the book, this title provides a good overview to constructing faces and features, then gives you the freedom to create on your own. The disc includes dozens of sound effects to add to your art and 700 cartoons to study and use. It ran achingly slow at times, though, and I doubt it'll ever make me cartoonist enough to give up my day job. —*Gabrielle Mitchell* ▶

How to Draw Cartoons

Grade: **B-**; LIST PRICE: $49.95; Diamar Interactive; 800/234-2627

READER SERVICE NO.674

Your Picture Here

Thinking about buying a color scanner to digitize your snapshots, but wishing for a legitimate business purpose to justify the expense? The **EasyPhoto SmartPage** scanner may be the answer. The $299 machine scans at up to 300 dpi in over 16 million colors. Eight-by-ten photos scan in 6 minutes; snapshots take less than 2. Installing the SmartPage's SCSI card took only 15 minutes. The beta unit we tested scanned a little dark, but the EasyPhoto software makes it easy to brighten photos, remove scratches, and adjust colors. You can also scan documents in gray scale, then use Xerox's TextBridge OCR software to turn them into editable text. The SmartPage's ease and low price make it a smart deal. (See "Low-Cost Scanners: Up Close and Personal" in April.)

–John Goddard

EasyPhoto SmartPage

GRADE: **A-**; STREET PRICE: $299; Storm Software, Inc.; 800/275-5734

READER SERVICE NO. 767

THE EASYPHOTO SMARTPAGE makes color scanning a snap.

KEEPING UP

Sick and Ye Shall Find

Are you suffering from confusion, delirium, agitation, or dementia? You might have Organic Brain Syndrome. Or you might just be spending too much time at your PC. In either case, you can do a quick self-diagnosis by dialing up **America's HouseCall Network** (http://www.housecall.com), an online medical database with information provided by the American Academy of Family Physicians. You'll get the scoop on more than 350 diseases, including symptoms, treatments, and the nasty medical fees you could incur. Coverage of some topics (such as alternative medicine) is skimpy, and the site's search engine is limited and slow. But most of the information is just what the doctor (would have) ordered.

Nolo Contender

The folks at **America Online** and **Nolo Press** are conspiring to make lawyers obsolete (one can hope). Nolo—the preeminent publisher of self-help law books and software—offers free legal seminars each week at its AOL site. Each Tuesday between 6 p.m. and 7 p.m. PST, a Nolo author hosts a chat session on a particular area of the law. (September's topic is small business.) Just use the keyword Nolo and click the chat icon. You can also find Nolo's self-help law center on the World Wide Web at http://www.nolo.com.

F Y I

Want to know the national debt—right down to the penny? Check it out on America Online (keyword public debt).

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TOO LITTLE, TOO LATE

LIKE ITS MESSIANIC HERO, the Who's *Tommy* continues to rise from the dead. The 1969 album has become a stadium rock extravaganza, a loopy movie, a sanitized Broadway musical, and recently, a CD-ROM. (Can a sitcom be far behind?) **Pete Townshend Presents Tommy: Then and Now** blends all of these elements into a digital stew that is sometimes fascinating, but ultimately unsatisfying. The disc opens with a beautiful montage of songs and images; click to launch video clips and compare the album, film, and stage versions of each song. But the clips are far too brief—with performances this rich, I wanted more. You also get rare concert footage, musings by Pete Townshend and mates, and an archive filled with Who trivia. If nothing else, this CD-ROM proves that the music—not the medium—is truly the message. —*Daniel Tynan*

THE TOMMY CD-ROM takes you on an amazing journey from the days of peace, love, and pinball to the nihilistic nineties.

Pete Townshend Presents Tommy: Then and Now

Grade: **B-**; STREET PRICE: $44.95; Interplay; 800/468-3772, 714/553-6678

READER SERVICE NO. 678

F Y I

88 percent of teens in homes with PCs say they use the machines for homework. But when asked to name their favorite software, 65 percent named games. Only 9 percent said educational programs.

SOURCE: THE CONSUMER ELECTRONICS MANUFACTURER'S ASSOCIATION

PLANET SIMULATION

I ADMIT IT: I'm bad at simulation games. But I don't let my lack of talent stop me from trying. And though Accolade's **Deadlock: Planetary Conquest** is a game I'll never win, I had fun losing. You make decisions about where to settle your colonists, what to build, and how to allocate your resources. You're pitted against up to six other alien races for control of this new planet. If you choose to play against human opponents (over the Internet or via modem), get ready for an even bigger challenge. All the players develop their strategies simultaneously, and it's difficult to keep up. If you like to lose, you'll have a good time. I certainly did. —*G.M.*

Deadlock: Planetary Conquest

Grade: **B**; LIST PRICE: $59.95; Accolade; 800/245-7744

READER SERVICE NO. 675

DOWN BY THE SEA

AIMED AT KIDS 6 to 12 years old, **One Small Square: Seashore** might snag a few fans among adults as well. You can explore 3-D representations of the shore and use the magnifying glass cursor to zoom in on microecosystems. As you move around, you trigger narrated animations and full-screen video clips about everything from tides and crabs to sea birds and sperm whales. The charming graphics resemble coloring books, and the navigation tools are easy to use. This disc achieves a fine balance between education and entertainment. —*Derk Richardson*

One Small Square: Seashore

Grade: **A-**; LIST PRICE: $34.95; Virgin Sound and Vision; 800/814-3530

READER SERVICE NO. 676

STARGAZING

Discover Astronomy takes you on a galactic voyage that starts with the Big Bang and keeps right on going. Adults and children can enjoy 3-D simulations of the sun, moon, stars, and more, all explained by Dr. Jacqueline Mitton, author of the *Penguin Dictionary of Astronomy*. See how craters form when meteorites impact the surface of a moon, and find your way around the night sky using animated lessons. Despite the heavy use of text, children age 6 and up will enjoy the visuals. But if your kids are science fiction or space movie fans, they may have seen a lot of this already. Discover Astronomy is really for beginners. —*Aoife McEvoy* ■

Discover Astronomy

Grade: **B**; STREET PRICE: $14.95; Maris Multimedia, 800/336-2947

READER SERVICE NO. 677

KEEPING UP

Scratch That

Even a small scratch can turn your Myst CD into a $50 coaster. Now **MacTec** may have an answer. Simply mail in your damaged disc, and MacTec will repair it and send it back within two to four weeks. MacTec claims it can restore music and video CDs as well as CD-ROMs, but can't fix cracked or deeply scarred discs. The service costs $11.99 for CD-ROMs and $5.99 for music CDs. MacTec Products; 800/293-0067.

And Bingo Was Its Name-O

Too tuckered to haul your butt down to the local Elks Lodge for the weekly bingo night? **The Bingo Zone** (http://www.bingozone.com) has a solution—and you don't have to wait for the weekend. It costs no money to play, and winners can take home up to $20 per game (a check will arrive in the mail). But screen redraws can be slow, even on a high-speed phone line. The virtual bingo hall is open from 10 a.m. to 4 a.m. EST on weekdays and 24 hours on weekends.

Browser Ball

Instant Sports (http://www.InstantSports.com/ballpark.html) offers animated updates of every major-league baseball game in the country. You'll need Windows 95 and Netscape Navigator 2.0. But even on a split T1 line, the updates flow at a leisurely pace—kinda like the game itself.

—Daniel Tynan

TALKING'S ONE THING SEEING'S ANOTHER!

AudioVision opens your eyes to a powerful new world of interactive communication.

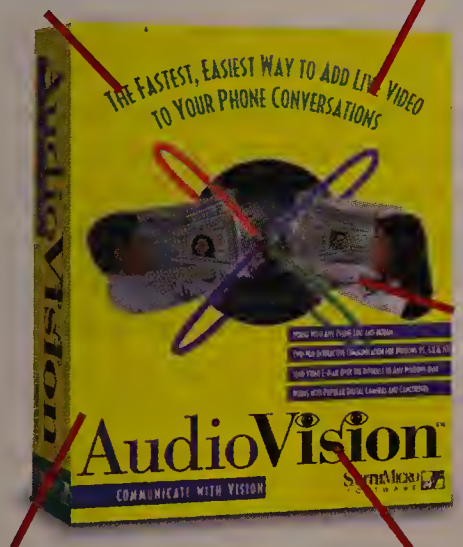
Whether your friends and family are halfway around the world or just down the street, AudioVision lets you see them face-to-face with eye-popping live digital video. Just add a popular digital camera such as those from Connectix or Vivitar (or even a camcorder with video capture board) to your PC with AudioVision, and you now have a powerful digital video phone that can communicate using two-way live video and audio sessions.

Send VMail over the Internet to any Windows user.

AudioVision is also the only product to offer VMail™ which allows you to record and send video e-mail messages over the Internet that any Windows user can view – even if they don't have AudioVision. With VMail, you can be heard and seen anywhere in the world for free. AudioVision was designed to be a good 'Internet Citizen' and is optimized to run fast over standard telephone lines, thanks to its powerful compression technology. In fact, it's as much as three times more efficient than other products. Simultaneous, real-time file transfer makes AudioVision the perfect small business communication solution too. But let's face it, AudioVision is just plain cool and will forever change communication – and for about $100.

Create and send VMail over the Internet

Designed for standard phone lines



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PC WORLD

TOP 5 HOME PCs

	SYSTEMS	Street price	Overall rating	PC World-Bench score	Reliability/ service	Setup rating	Comments	Reader service number
1	Dell Dimension P-100t 800/613-3355 http://www.dell.com	$1999	77	173 very good	good/ best	satisfactory	**FEATURES:** P-100, 16MB of RAM, 1GB hard disk, BX CD-ROM drive, 28.8-kbps modem, 15-inch monitor, Microsoft Office. **PROS/CONS:** Bare-bones mail-order machine, great price, great performance for a P-100, excellent service. Assembly not as user-friendly as with many of the other home systems.	635
2	Compaq Presario 9240 800/345-1518 http://www.compaq.com	$2498	76	147 good	good/ good	good	**FEATURES:** P-133, 16MB of RAM, 1.2GB hard disk, 4X rewritable PD-CD-ROM drive, 28.8-kbps modem, 15-inch monitor, answering machine, eight home software titles. **PROS/CONS:** Great new price. PD-CD-ROM drive stores 650MB on its special CDs and plays standard CD-ROMs at 4X speed. Performance not exceptional for a P-133.	636
3	Gateway 2000 P5-166 Family PC 800/846-2000 http://www.gw2k.com	$2699	73	199 outstanding	fair/ good	good	**FEATURES:** P-166, 16MB of RAM, 2.5GB hard disk, BX CD-ROM drive, 28.8-kbps fax-modem with voice mail, 17-inch monitor, 16 home software titles. **PROS/CONS:** Very fast, good price, high-end features. Gateway's so-so reputation for reliability and phone-based tech support make this a system for the confident user.	637
4	Hewlett-Packard Pavilion 7170 800/724-6631 http://www.hp.com	$3248	73	168 good	good/ good	very good	**FEATURES:** P-166, 16MB of RAM, 2GB hard disk, 6X CD-ROM drive, 28.8-kbps modem, 15-inch monitor, answering machine, 30 home software titles, voice mail. **PROS/CONS:** Hardware MPEG, wavetable sound, great software bundle. Relatively high price, must use HP's Multimedia Monitor (price included here) for voice mail to work.	638
5	Compaq Presario 9234 800/345-1518 http://www.compaq.com	$2298	73	129 satisfactory	good/ good	good	**FEATURES:** P-120, 16MB of RAM, 1.6GB hard disk, 4X CD-ROM drive, 28.8-kbps modem, 15-inch monitor, answering machine, eight home software titles. **PROS/CONS:** Low price, Compaq's reputation for reliability. But P-120 processor and 4X CD-ROM drive aren't state-of-the-art, speed is so-so, and software bundle is unexceptional.	639

Best Buy http://www.pcworld.com/top5soho

HOW WE TEST The overall rating is based on reliability and service (30 percent), price (20 percent), PC WorldBench performance (20 percent), setup (10 percent), compatibility (10 percent), and extra features (10 percent). Reliability and service ratings are based on results of PC World's Reliability and Service Monitor survey. For more information about all products in this table, circle reader service no. 903.

CHEAPER MEMORY AND STIFF COMPETITION bring lower prices and better value to this month's Top 5. A price drop from Compaq lifts the Presario 9240, with its nifty rewritable PD-CD-ROM drive that serves both as a backup device and as a 4X CD-ROM drive, to number two on our chart. A lower price also pushes the simpler Presario 9234 back into the Top 5.

And this month there's new blood in the chart from Gateway 2000. The competitively priced P5-166 Family PC—a speed demon that comes loaded with a 2.5GB hard drive, a 17-inch monitor, and Altec speakers—takes the number three slot. This system will give you a lot for your money. Only Gateway's service and reliability scores kept it from reaching the top of this month's list.

Once again the Dell Dimension P-100t captures the number one spot. This barebones budget system offers great performance—it's as fast as many P-133s—but at a P-100 price.

But remember, Gateway and Dell systems are available only through mail order, and that means you'll have to handle any technical problems over the telephone. For that reason, these computers are best suited for the buyer who wants lots of power and is willing to pop the lid if the need arises.

We tested one new machine that didn't make the chart: the Netis N5166C. The Netis came loaded for bear with 32MB of RAM and, as a result, it ran through our tests with blazing speed. But performance isn't everything. The company's mediocre service and reliability scores kept it out of the running.

Two machines that dropped off the Top 5 chart this month may make a quick return. The Micron Home MPC Pro, we've been told, has an all-new configuration. We'll test the new version next month. We'll also take a look at a final production model of the Hewlett-Packard Pavilion 7130P. The 7130P is a solid family PC with a built-in scanner and a good, home-oriented software package. According to the company, the newer version will perform better than the preproduction model that we tested. We'll see.

—*Kirk Steers* ■

DELL IS STILL THE WINNER with its P-100t, a fast, low-cost system.

Kirk Steers is a contributing editor for PC World.

If you think file transfer is all we do, you need some time away from the office.

Designed for Microsoft Windows 95

To appreciate how much more LapLink® for Windows® 95 has to offer, all you have to do is hit the road.

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By now, you probably can't wait to get your hands on the latest LapLink. So you'll be glad to know that upgrading—from an earlier LapLink, or from another product altogether—is ridiculously inexpensive. Call 800-487-4396. Better yet, see your reseller. It'll give you an excuse to get away from the office.

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Speedup Tricks for Internet Surfing

YOU FOUND ME. Good. What with my column's new location, I was worried. I wanted to put a hot link on the last page pointing to this one, but my editor nixed the idea.

Let's face it: Finding something in print is even harder than finding it online, although at least you don't have to wait while words and pictures slowly appear on a piece of paper. Not that getting around the Internet is a piece of cake. We all know it's a major hassle, which brings us to this month's topic: cool tricks for getting more out of your online time.

I've written these tips specifically for Netscape Navigator, not only because it's the most popular Web browser around, but also because it's my favorite. If you don't have Navigator, it's easy to get ahold of: You've probably seen the "Netscape Now" button on dozens of Web pages (it's become more ubiquitous than AOL start-up disks). But in case you haven't, the address is http://home.netscape.com/comprod/mirror/index.html. (For the record: International Data Group, the parent company of *PC World*, is a minority shareholder in Netscape Communications.)

"Every Tom, Dick, and Harriet with **a Web page** feels obligated to give it a highly textured, **gaudily colored** background."

CLEAN, QUICK BACKGROUNDS

EVERY TOM, DICK, and Harriet with a page on the World Wide Web seems to feel morally obligated to design it with a highly textured, gaudily colored background. These Andy Warhol wanna-bes drive me crazy—even my ultrafast ISDN phone line chokes on backgrounds of patterned oak trees, bricks, and fish scales. With a modem, they're ridiculous.

Tell your browser to stick with your own background, and you'll save seconds of download time—sometimes minutes. In Navigator, select *Options•General Preferences* and click the *Colors* tab. Check *Always Use My Colors* and click *OK*. Your screens will be drab, but fast—and probably easier to read.

LICKETY-SPLIT SEARCHES

IF I'M LOOKING FOR something specific on a page I've never browsed before, I use **<Ctrl>-F** to bring up Navigator's handy Find tool. Then I can type, for example, 'Trek' to find all the *Star Trek* movies on a film review Web page. If that's taking too long, I use **<Ctrl>-N** to open up another window on a different site. **<Ctrl>-<Tab>** lets me pop between the two pages.

You can find some of Navigator's best features by simply clicking on something—almost anything—with the right mouse button. For example, right-clicking a link will let you add a bookmark, go backward or forward, or copy the link to the Clipboard.

UP FOR GRABS

THROUGHOUT A typical workday, I bump into addresses for tons of enticing Web locations and Usenet newsgroups. Some are so compelling that I want to drop everything, log on to the Web, and pay a visit.

Instead, I use URL Grabber, an ingenious shareware utility that floats on my desktop, waiting for me to copy and paste addresses into it, adding descriptions as I wish. Then, when I want to explore, Grabber launches Navigator, displays a page with my URLs as links, and lets me click merrily away.

You can try a demo of the Windows 95 version, limited to three URLs, as grabr95.zip on PC World Online. If you register the program, it will let you stash away an unlimited number of URLs. You say you haven't upgraded to Windows 95 yet? Don't fret, you're still in luck. The author of URL Grabber has agreed to let *Home Office* readers download a demo copy of the Windows 3.*x* version, available as grab.zip on PC World Online. This trial version will let you grab up to 5 URLs.

Now that you know my new location, you can put a bookmark here—at least the paper kind. ■

Netscape Navigator

$49; Netscape Communications Corp.; 800/638-7483; http://www.netscape.com

READER SERVICE NO. 739

URL Grabber 95

$19.95; URL Grabber (demo versions) free on PC World Online; Brooklyn North Software Works; 800/349-1422, 902/493-6080, 902/835-2600 (fax); http://www.brooknorth.com/

READER SERVICE NO. 740

Find files from this article at http://www.pcworld.com. Contributing Editor Steve Bass is a licensed marriage and family therapist and president of the Pasadena IBM Users Group.

PC WORLD

MULTIMEDIA EDITION

ILLUSTRATIONS BY GORDON STUDER

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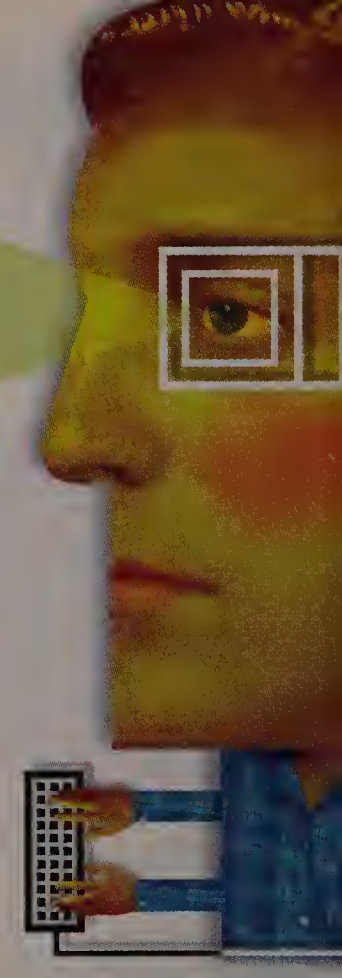
Zine & Heard

THE BEST OF THE WEBZINES



DIANE MEHTA

THE GREAT THING ABOUT THE WORLD WIDE WEB is that anyone can publish an electronic magazine at little cost. The bad thing is that so many people do. The ease of electronic publishing has spawned the Webzine, an entirely new genre that merges many characteristics of traditional print magazines with some aspects of broadcast media.

What separates a Webzine from other Web sites? A Webzine updates its content on a regular schedule, using interactivity and multimedia in ways that print publications can only dream of. And a true electronic zine is an entity unto itself—not an extension of an existing publication, TV show, or company product line.

True, most Webzines devote themselves to ephemera, kitsch, and tedious ravings. But a handful of well-written zines can compete with their paperbound brethren in content, design savvy, and journalistic integrity. We identified eight that explore culture, politics, and literature and exploit the electronic medium with verve and originality.

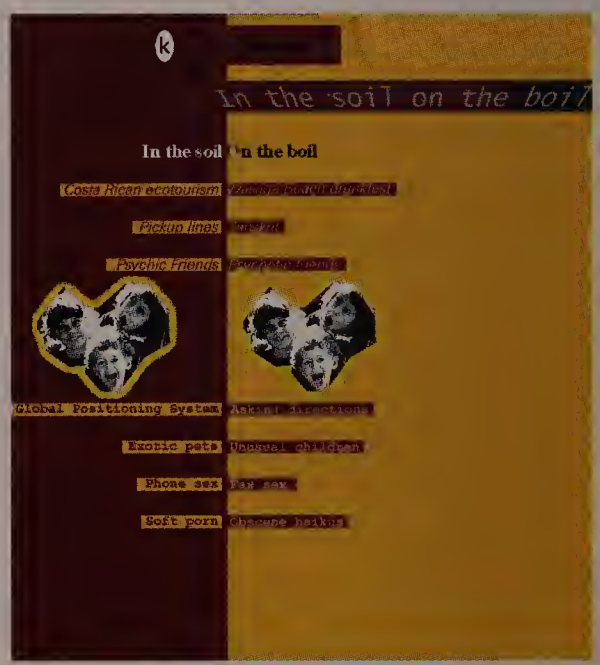
Since these zines update their content regularly, our review is a virtual snapshot in time. However, all archive their articles and discussion threads, so you can browse earlier material. Here, in alphabetical order, are some Webzines worth the connection charges.

Think the Web lacks intelligent content and lively commentary? These multimedia Webzines merit bookmarks in your browser.

ILLUSTRATION BY GORDON STUDER

CAKE TIMES
WWW.CAKETIMES.COM

WITH ITS DEADPAN humor, colorful images, and snappy text, this zine suits an audience ranging from Letterman fans to first-year philosophy students. An amusing interactive soap opera called "Cineclips" invites you to write your own endings. A literary cafe game consists of matching an excerpt from a famous work (say, *Huckleberry Finn*), to



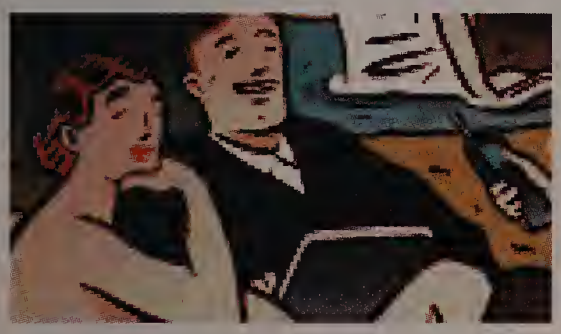
CAKE TIMES' ECCENTRIC humor and nonlinear exposition make it worth a surf.

the name of a fictional restaurant (the Top O' the Mark Twain). There's also an "In the Soil/On the Boil" column (a rip-off of Wired's "Wired/Tired"), a design-an-ad-banner exercise for people fed up

with dull Webmercials, and some clever news items. Though the content is sliced a bit thin, Cake Times is a still a treat.

FEED
WWW.FEEDMAG.COM

If your brain needs stimulation, hurry to Feed, where leftist views of politics and culture are expressed in stories on Pat Buchanan's populism, the panic over child sexual abuse, and other newsworthy topics. The graphics are clean, the pages easy to navigate, and the links smart and useful. Feed even provides explanatory captions to the links, so you don't end up looking at a recipe for chicken salad. Here you'll find intelligent discussions of books, issues, politics, and journalism. Feed may lack puzzles and polls (not necessarily a deficiency), but the columns are chock-full of strong opinions. The "Fil-

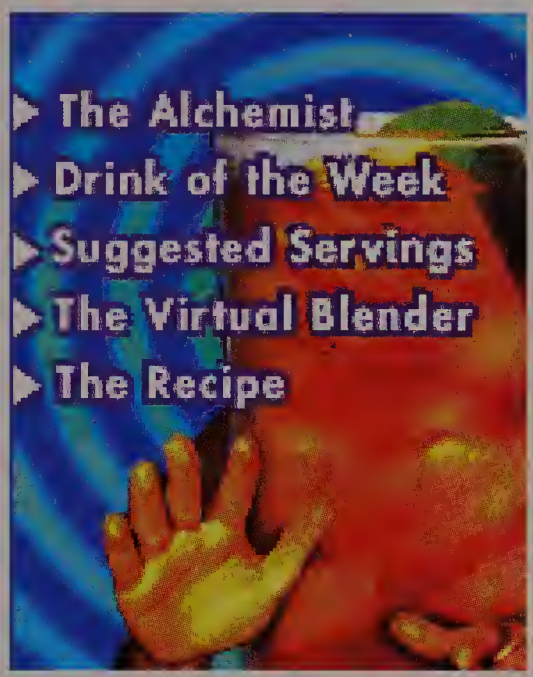


FEED'S LIVELY DISCUSSION area focuses on critical commentary and opinions.

ter Five" section includes witty, topical briefs, such as an item about the resurgence of Hush Puppies and sound bites from the Republican primaries. In a piece on the best and worst of 1995, Feed reviews the events and personalities of the year with wit and originality.

HOTWIRED
WWW.HOTWIRED.COM

Geared toward everyone from digerati to urban hipsters, HotWired showcases popular culture with trend updates, interviews, politics, and reviews. HotWired's "Piazza" section offers numerous chat forums, including ones especially for sci-fi enthusiasts and politically minded surfers. The "Covert Culture" interview series is devoted to fringe personalities. "Netizen," HotWired's political arena, hosts discussion groups and posts worthwhile audio of speeches, news, and

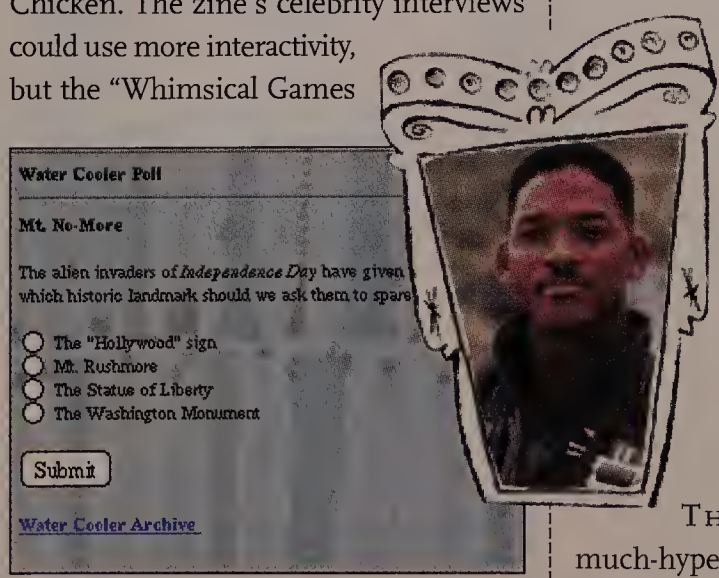


POP PHENOMENA AND political news figure prominently in HotWired's versatile zine.

commentary. You'll also find reviews and features that focus on TV, music, art, and books. The "Pop" section offers a live chat series with celebrities such as Yoko Ono and members of the punk band Pavement. "Zines" is a unique daily review of obscure print magazines; the daily Web site review, "Surf du Jour," covers its beat with similar freshness and eclecticism. HotWired's stories range from politically insightful to entertainingly irreverent.

MR. SHOWBIZ
WWW.MRSHOWBIZ.COM

Starwave's Webzine focuses on kitsch-and-tell celebrity gossip and other light fare of the E! channel variety. News topics range from hamburgers to the similarities between Mae West and Dennis Rodman. On the iconographic side, you get haiku by Elvis devotees and a picture of the national headquarters of Kentucky Fried Chicken. The zine's celebrity interviews could use more interactivity, but the "Whimsical Games



MR. SHOWBIZ FEEDS your Hollywood hunger.

of Skill," in which you identify celebrity quotes, is fun and quick—perfect for this medium. Daily celebrity snapshots and vocabulary words are two good reasons to surf here, and a third is the gleefully smarmy tabloid section, "The Wonderful World of Mr. Showbiz." Stargazers will appreciate the interactive tools provided for locating celebrity bios and browsing the top 250 music albums.

SALON
WWW.SALON1999.COM

In stark contrast to the entertainment-oriented Mr. Showbiz, Salon concentrates on highbrow literary commentary for the *New Yorker* crowd. Articles are concise, and Salon's minimalist look eases the pain of reading on screen. Salon posts audio when appropriate, as in a story featuring clips of accomplished poets reading good poetry—something as rare on the Web as on paper. You'll get thoughtful features, comics, quotes, and interviews. Occasionally, a bad article

SALON HAS A SPARE design and a controversial outlook on literary and political happenings.

sneaks in, such as a self-congratulatory piece on how the author now wears all white instead of black. Perhaps the best section is the "Media Circus," featuring urbane opinions about the media, including pieces on print and online magazines criticizing other magazines. You'll also find insightful music and book reviews and a timely "Newsreal" section about politics.

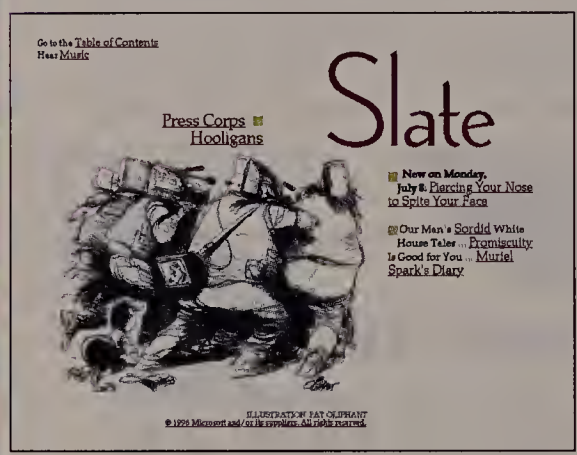
SLATE
WWW.SLATE.COM

The debut issue of the much-hyped Slate attempts to fulfill editor Michael Kinsley's promise to main-

tain editorial independence from owner Microsoft. The zine's first debate involved disputation over whether Microsoft's monopolistic behavior inhibits competition. Unfortunately, the panelists were unable to reach a conclusion.

Kinsley, former *New Republic* editor and cohost of CNN's "Crossfire," clearly wants to produce an online cross between *Harper's* and the *New York Times Magazine*. But little besides the interactive component sets Slate apart from intellectually and politically oriented print journals.

You get the usual reviews of books, movies, and TV shows; a weekly poem selected by Robert Pinsky, former poetry editor of the *New Republic* (the first poem chosen was by 1996 Nobel Laureate Seamus Heaney); a cartoon strip; an interactive puzzle; a William Safire–style column on language deconstruction; and plenty of political commentary.



SLATE LAUNCHED with a bang, not a whimper.

Slate has one other thing in common with its print cousins: Starting in November, readers will have to pay a subscription fee of $19.95 a year.

STIM
WWW.STIM.COM

A Prodigy zine for Gen-Xers, Stim admirably attempts to use multimedia innovatively, but the downside is long waits and interminable downloads. The screens are bright and peppy, characteristic of Stim's youthful verve: The editors happily distribute pop observations instead of Salon's highbrow erudition. The "truth or dare" column is one of the more original interactive sections: You e-mail your questions (truths) or suggestions (dares) to Stim. A story on charlatan psychics and several embarrassingly bad poems rank among the zine's weak-

STIM IS BOLD, a bit kitschy, and thoroughly multimedia-happy.

er offerings. "Build Your Own Sex Symbol," a story about the pin-up girl craze of the 1940s, would have been fun if it had really let you build your own pin-up instead of limiting itself to a rundown of the technology of retouching. Stim's interactive areas let you chat graphically using avatars or (if you own the right gear) to videoconference with your pals.

URBAN DESIRES
WWW.DESIRES.COM

THIS ZINE'S ECLECTIC and entertaining stories focus on metropolitan events and people. An article about prostitutes even includes an e-mail address for the subjects. One time-waster lets you create Mondrian-like art by using mouse clicks. You also get interactive comics, such as a spine-chilling, black-and-white story of New York rats and subways—a gory interactive mystery where clicking on an item highlighted in color launches sound bites. Some amateur rants, fiction, and

URBAN DESIRES: The bizarre in pop culture.

reviews supplement these offerings.

Urban Desires makes wise use of multimedia, mixing stories with graphics, short audio clips, and easy navigation buttons. The "Performance" area has thoughtful reviews and interviews, and a good selection of movie clips. The music section offers interesting interviews, audio samples, and videos. ■

The Best Zines Money Can Buy

AT THE MOMENT, WEBZINES are essentially free. But as in many other areas of the Web, that's about to change.

Many electronic publishers are discovering that advertising revenue alone doesn't cover the cost of producing fresh Web content. So, like their print cousins, they're selling subscriptions. Trendsetter Microsoft has decided to charge an annual subscription of $19.95 for its Webzine, Slate, starting November 1. Not to be outpriced, the *Wall Street Journal* has announced that it will charge $49 per year ($29 for subscribers of the print version) for access to its Web site. The electronic versions of *Playboy* and the *New York Times* are among the Webzines poised to follow suit.

What will it take to convince people to pay for information they're used to obtaining gratis? According to Dan Ludlum, an analyst with the market research firm International Data Corporation, Webzines will have to add more interactive elements, such as searchable databases of sports statistics or personal finance information.

With the added revenue from subscriptions, many Webzines should be able to improve the quality of their content. But as the competition for paying subscribers heats up, more zines will go belly up.

–D.M.

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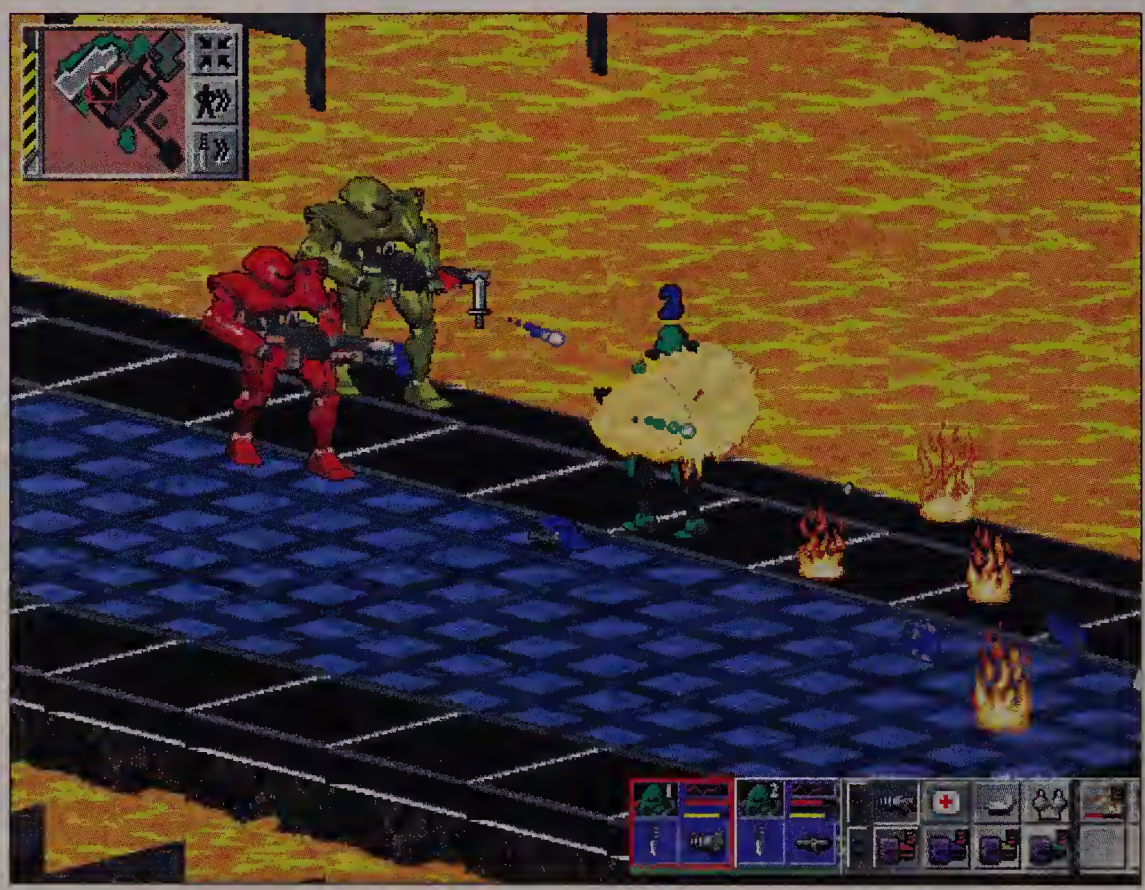
Mayhem Reigns as X-Com Meets Crusader

ENTERTAINMENT

If you cross MicroProse's X-Com and Origin's Crusader—two demigods from last year's gaming pantheon—what do you get? Eidos Interactive's answer is the delightful but finicky **Total Mayhem.**

As in X-Com, you lead a band of soldiers through increasingly intricate missions, blasting enemies while trying to regain control of your planet. Unlike X-Com, however, Total Mayhem plays in real time: Take too long pondering a move, and you risk getting shot. The action unfolds in three-quarter view, with high-definition SVGA graphics that are sharp but less breathtaking than Crusader's.



SEEK AND YE SHALL DESTROY: But Total Mayhem's mechs are thinking the same thing.

You manage your forces' operations from Mayhem Base, where you receive briefs on all 20 missions, upgrade armor and shields, recruit soldiers, and acquire and sell weapons and ammo. In each mission you use laser and plasma rifles and explosives to battle mechanoids (robotic monsters) and coerce their more vulnerable members to join your forces. You can control your soldiers as a unit or individually, positioning them strategically for the ultimate ambush.

Along the way, you search for keys that unlock secret levels. It helps to pick up nearly everything you find: You'll need spare batteries to keep your shields and your servos charged, medic kits to heal wounds, and (of course) extra ammo.

Mayhem's multiplayer option permits up to six networked Windows 95 users to dispense with the solo game's altruistic missions in favor of a nerve-racking demolition-derby-style game of laser tag. The last soldier standing wins.

But Total Mayhem isn't a total triumph: Exacting controls make maneuvering soldiers around corners, through doorways, and alongside buildings needlessly difficult. Frustrated users have also reported numerous installation problems, for which Eidos volunteered little or no support. The company has posted a list of compatible video cards on its CompuServe site, however, as well as a patch that it claims should fix most installation errors.

If they can get it to run, X-Com and Crusader fans looking for hybrid strategy-adventure action will find Total Mayhem totally absorbing. —*Joe Hutsko*

Total Mayhem

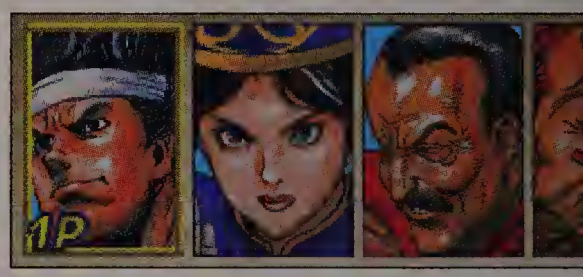
$49.95 list; Eidos Interactive; 415/616-2022.

Grade: **B**

READER SERVICE NO. 741

3-D DUKEFEST

Like its popular arcade ancestor, **Virtua Fighter PC** has stunning visuals, fast-paced action, and virtually no instructions on how to play it. In the arcade, gamers willingly burn quarters figuring out ambiguous controls. But on the PC, that approach just doesn't cut it.



With fast-moving polygonal characters and free-floating camera angles, Virtua Fighter PC is technologically impressive. In terms of combat, this fighting game recycles Street Fighter II: Each character possesses an arsenal of attacks and defenses, and play consists of an endless string of hand-to-hand dustups. But of

VIRTUA FIGHTER doesn't hold back when it comes to full-contact action.

course the point of this dazzler isn't to play, but to watch. Why else would the programmers include a No Player option for sitting back and enjoying the full glory of real-time 3-D animation?

The game's only fault is its omission of helpful documentation. The manual and help file explain only the most generic moves (kick, punch, and jump). A lot of trial and error goes into discovering the six-key combination that makes your character do a leaping knee kick followed by a somersault. And only the most persistent gamers will find time to sleuth out each character's unique hidden moves. A detailed description of the attacks and defenses at your disposal would even the playing field between your characters and the ones the computer controls. Without such guidance, playing Virtua Fighter PC

is like trying to play chess without knowing what moves the pieces can make.

But watching two computer-controlled characters (who apparently had access to a detailed manual) duke it out is astounding. By contrast, in the match I waged against a friend, the two fighters faced away from each other, jabbing and kicking into space. —*Jeffrey Adam Young*

Virtua Fighter PC

$49 street; Sega Entertainment; 888/734-2472. Grade: **C**

READER SERVICE NO. 742

DOUBLE-HEADER AT THE VIRTUAL PARK

WITH THE PENNANT races heating up, two new baseball titles get you into the swing without using weighted donuts: **Tim McCarver's The Way Baseball Works** and the 1996 version of **Tony La Russa 3.**

The Way Baseball Works focuses on the fundamentals, attempting to distill the sport into its essential elements. Unfortunately, this two-disc package fails to connect most of the time.

The first disc is divided into four sections. In the first, Fox announcer (and longtime Cardinals catcher) McCarver analyzes different game situations, letting you know how each player at each position should react, depending on the play. For instance, after a batter bunts, McCarver explains the reactions of each player involved in the play. After a weak segment on batting and a quick tutorial on scoring and statistics, the guide gets physical, analyzing hitting and pitching in terms of the physics of bat and ball.

The second disc summarizes the rules of the game, offers comprehensive historical highlights, and provides a glossary of terms. Although it's a thoughtful production, it isn't particularly exciting.

Prefer more action and less analysis? Tony La Russa 3, a perennial MVP contender among baseball simulations, offers a roster of new options, such as head-to-head statistics showing how a particular pitcher and batter have fared against one another in previous matchups.

The disc also lets you vary the speed of different aspects of game play, improving the arcade aspect. The statistics, league play (with free agents and trades), and other fantasy league options that baseball fans have come to love are top-notch, though the batting and fielding are still a bit tough to master. If you already own the 1995 edition, the new version offers too little new material to warrant upgrading; but if you don't, the 1996 edition is a steal. —*Hugh Foster*

Tim McCarver's The Way Baseball Works

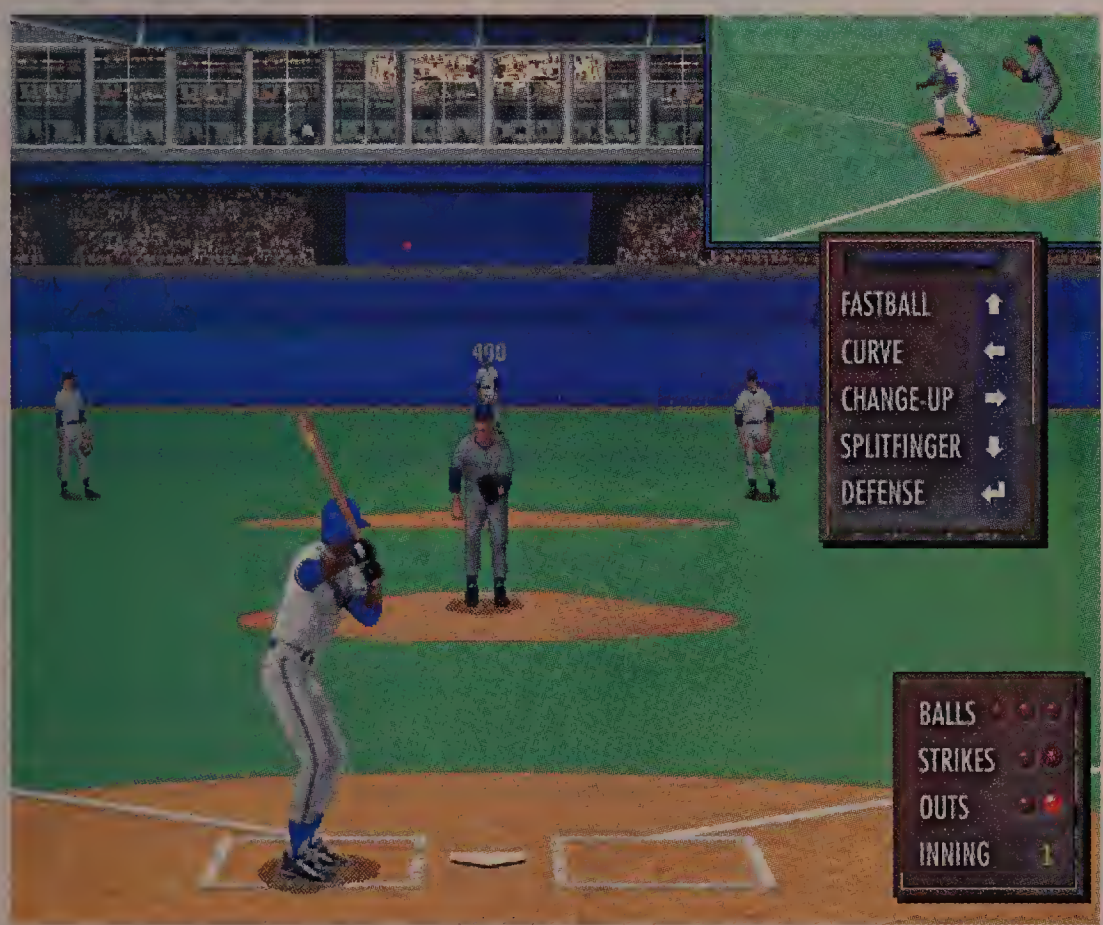
$39.95 street; Byron Preiss Multimedia; 800/945-3155. Grade: **B-**

READER SERVICE NO. 743

Tony La Russa Baseball 3: 1996 Edition

$39.95 list; Stormfront Studios; 800/245-4525. Grade: **A**

READER SERVICE NO. 744



CHOOSE YOUR PITCH CAREFULLY in Tony La Russa 3, or the eager batter may swat that juiced-up orb right out of the ballpark.

MYSTERY TOMB

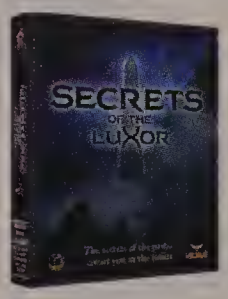
YOU'LL FIND THAT it's easy to get lost in Mojave's **Secrets of the Luxor**—for hours at a time. And in this graphics-intensive adventure, time is of the essence.

In the role of a renowned archeologist, you explore the chilling 3-D catacombs and breathtaking chambers of a tomb filled with technology far more advanced than our own. Figuring out how past, present, and future fit together is no small feat. Unraveling Luxor's secrets and puzzles—from dismantling bone-crushing traps to hacking into a peer's expedition computer—will take even die-hard players a long time.

Luckily, you don't tackle this project empty-handed. Useful provisions include an instant camera for taking snapshots of your discoveries (such as a wall of intricate

hieroglyphics); a journal swollen with descriptive prose, illustrations, and clues; a miniature Hi-8 video player for watching prerecorded clips; and a virtual headset that makes clever use of QuickTime VR, letting you scan completely around a room for passages and clues that are invisible to the naked eye. Not since Activision's Spycraft have in-game gadgets been so much fun to use.

Smooth transitions ease the way from one mostly static scene to the next. Even simple tasks, such as throwing switches or turning knobs, are well animated and convincingly real. The screen suddenly goes black, however, any time you access the Options menu (to change sound levels, save games, or access your inventory). In a game that propels you so deeply into another time and place, this sudden visual break is jarring.



Nevertheless, with its twisted premise and its effective use of QuickTime VR, Secrets of the Luxor provides a commendably Myst-ical escape. To triumph, adventurers must exercise special care to leave no stone unturned. —*Joe Hutsko*

Secrets of the Luxor

$49 street; Mojave; 800/678-7282. Grade: **B+**

READER SERVICE NO. 745

REPTILE HEAVEN

TALK ABOUT THE EVOLUTION of the dinosaurs: First there was Knowledge Adventure's 3-D Dinosaur Adventure; then came Microsoft's Dinosaurs; and now there's **Dinotopia**, the multimedia adventure game based on James Gurney's lavishly illustrated book of the same name. Intended for anyone older than 8 who has an affection for terrible lizards, Dinotopia is fanciful and fun, though its performance occasionally wobbles.

The plot is simple: Following a shipwreck, a protagonist named Nathan explores a charmed island where humans and dinosaurs live together in harmony. As Nathan wanders the island in search of his lost sister, he learns Dino-speak, discovers dinosaur habitats, and explores the ghostly wreck of the ship.

This adventure game is full of riddles to solve. As you explore the enchanted isle, you collect tools that will help you solve the central mystery.

Dinotopia's use of video is unique. Click on a graphic of a dinosaur, and realistic dinosaur puppets talk to you. Unfortunately, these intriguing clips are marred by imperfect replay quality; even on my Pentium-166, response was sometimes halting, images blurred around the edges, and the animals' lips were out of sync. Despite these disappointments, the game is refreshingly creative and nonviolent—a welcome addition to any young dinosaur-lover's collection. —*Bronwyn Fryer*

Dinotopia

$49.98 list; Turner Interactive; 800/294-0022. Grade: **B+**

READER SERVICE NO. 746

IF YOU TIRE OF ROAMING Dinotopia's charmed island, you can tour the world beneath it.

BE NORMAL – IT'S THE LAW

IMAGINE A WORLD where lying around passively watching TV and eating junk food is not only encouraged but required by law. Sound like a dream come true? In the challenging puzzle game **Normality**, you become an inhabitant of a warped world where police enforce the couch potato lifestyle and where asserting your individuality can get you arrested.

The game takes place in Neutropolis, a dark and polluted city controlled by a villainous dictator. Using mind-altering gizmos implanted in common consumer goods, this evil ruler keeps a majority of the population in a vegetative state. Refusal to submit lands you in prison for some intensive social reprogramming.

YOU'LL NEED TO RELY on out-of-the-ordinary characters to find your way through Normality.

You play Kent, a scruffy Gen-Xer under arrest for being different. First, the Norm police force you to listen to hours of elevator music in an attempt to Normalize you; then they lock you in your apartment and order you to watch television. Of course, escape is your main objective. Once you succeed, you and fellow freethinkers form a resistance squad bent on overthrowing the evil regime.

Despite Normality's intriguing plot, the puzzles are a little too difficult to solve. I spent hours in the first room alone trying to figure out which inventory pieces I needed to get to the next clue. Hard-core puzzle freaks may relish Normality, but there's a limit to the amount of time I'm willing to spend on a game without seeing some results. —*Richard Popko*

Normality

$49.95 list; Interplay Productions; 800/468-3775. Grade: **C**

READER SERVICE NO. 747

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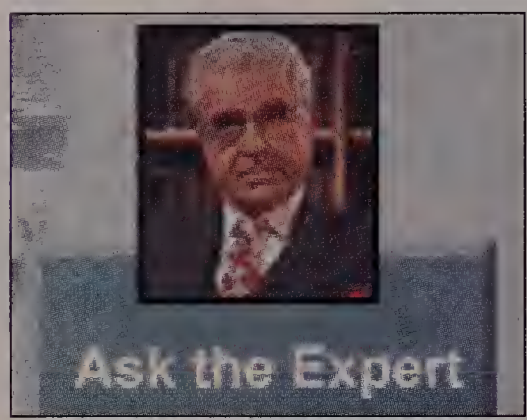
Circle 18 on reader service card

REFERENCE

WILL POWER TIMES TWO

BEFORE WE "kill all the lawyers," as one of Shakespeare's characters advised, we'd do well to check out **Kiplinger's Home Legal Advisor** and **Quicken Family Lawyer.**

Consulting the easy-to-use Kiplinger's sure beats spending a fortune on legal bills. This excellent resource for putting together a legal document isn't meant to replace a lawyer, but it promises to save you a lot of time, energy, and money in the stages before you hire one.



ABC-TV'S LEGAL EAGLE Arthur Miller offers advice in Quicken Family Lawyer.

A graphic of a desktop (complete with banker's lamp) lets you open documents, change your user profile, or get video tips from virtual legal experts on how to use each document. The well-designed disc contains 68 legal forms ranging from prenuptial agreements to wills. You can fill in the blanks with an integrated Windows word processor before printing documents and presenting them to a professional eye. (A friendly voice coaches you along the way, and an extensive help section takes over where the voice leaves off.)

You even get help with such useful endeavors as getting your name removed from junk-mail lists; and the entire *Kiplinger's Handbook of Personal Law* is included. Probably the only people who won't like the disc are lawyers.

Another digital attorney, Quicken Family Lawyer, has been around a while, but version 7.0 adds lots of new features that make it easier to prepare legal documents such as wills and affidavits.

Family Lawyer's biggest improvement is its simplified data entry box. You answer questions in the top half of the screen, while the bottom half shows you the document with the new information in place. A checklist tells you what information to gather before you start filling in the blanks. A Document Suggestions Wizard identifies legal documents you're likely to need to complete a given form.

While markedly improved over previous versions, the $49 package lacks the audio coaching and solid integration of the Kiplinger's disc. The sales-heavy introduction skimps on useful information.

On the other hand, you get 12 more documents with Quicken than you get with Kiplinger's, and a built-in Netscape Navigator module lets you tap into the Parsons Web site to track legislative and software changes. —*Bronwyn Fryer*

Kiplinger's Home Legal Advisor Deluxe Multimedia

$29.95 street; Block Financial; 800/813-7940. Grade: **A-**

READER SERVICE NO. 748

Quicken Family Lawyer 7.0

$49 list; Intuit/Parsons Technology; 319/395-9626. Grade: **B+**

READER SERVICE NO. 749

AN IMPRESSIONIST IN YOUR LIVING ROOM

COULDN'T MAKE IT to Philadelphia this summer for the blockbuster Cézanne exhibit? Then why not host your own major cultural event with Corbis's **Paul Cézanne: Portrait of My World**? Of course, a digital display of the French master's works can't replace seeing his Impressionist paintings in person, but the disc compensates by providing a meticulous examination of Cézanne's life, paintings, influences, and contemporaries.

The disc presents five environments (studio, train station, landscape, museum, and cafe) that showcase important paintings and feature voice-over commentary taken from the artist's writings.

Clicking a Works button brings up numerous key paintings by Cézanne and other artists of the period, along with textual analysis. The paintings, which you can zoom in on, aren't identified by name or painter until you click a second time—a minor annoyance. Navigation would be easier with more on-screen tools, but a handy and innovative QuickMove function does show you areas you missed.

The tour begins and ends with Cézanne's *Les Grandes Baigneuses* (The Large Bathers). It's intensely satisfying to find the famous painting looks different after the disc's hours of education than it did before. Cézanne once said, "With an apple, I want to astonish Paris!" Ninety years after his death, he continues to astonish the world. —*Kimberly Stein*

Paul Cézanne: Portrait of My World

$49.95 list; Corbis; 800/246-2065. Grade: **A-**

READER SERVICE NO. 750

A TOUR OF PAUL CEZANNE'S life and times begins in the artist's studio in Aix-en-Provence.

TWENTY YEARS OF AIR SUPERIORITY

HEY, TECHNO-RAMBO, are you ready to win this time? Then check out **Wings: Saigon to Persian Gulf**, the third installment in the Discovery Channel's planned five-disc history of military aviation. This offering, which covers the years of America's rise from superpower palooka to peerless global police officer, presents the same sensibly designed menu of features that its two predecessors used.

THE SOVIET MIG-31 Foxhound "poses a serious threat," according to Wings.

For appetizers you can inspect 3-D warplane models, amble through virtual air bases, watch air combat animations, and test your flying skills with three simulations.

All the meat and most of the potatoes, however, are contained in two other sections: An impressive database of 524 aircraft and 279 weapons contains photos of each plus extensive accounts of developmental history, design variants, and buyer nations (but no cost information); and a compressed Theaters of War history of the years 1975 to 1996 offers chronologies, maps, and 33 short videos.

Wings adopts a Pentagon-based view of history, so the execution of U.S. military planning tends to be characterized as "precise" and "exceptional." Events that receive video attention include the Arab–Israeli conflict, the 1986 U.S. bombing of Libya, Desert Shield/Storm (in great detail), the U.N. air campaign in Bosnia, and (a sad vestige of an unexceptional, imprecise past) the helicopter evacuation of Saigon in 1975. Anyone seeking insight into the political and historical sources of these conflicts will find Wings' coverage arid. But fans of handsome aircraft and we're-number-one technology will have a blast. —*Steven Gray*

Wings: Saigon to Persian Gulf

$39.95 list; Maris Multimedia/Discovery Channel Multimedia; 800/678-3343. Grade: **B**

READER SERVICE NO. 751

PROPAGANDA AND PERFECTION

"IN AMERICA, we're often what we buy," states narrator Rick Prelinger in Voyager's **Our Secret Century** CD-ROM series. The series surveys the numerous conformity, industrial, and safety films produced from the 1930s to the 1960s. Prelinger characterizes these films as secret because, although they do chronicle the United States' historical past, they emerged out of corporate sponsorship of products and educational instruction.

A 1946 ADVERTISEMENT by Allied Chemical and Dye promotes coal products.

Each disc's well-designed interface lets you quickly access the films, which vary in length from several minutes to almost half an hour. You also get links to historical commentary and criticism, interviews, articles, and a useful search tool.

Volume 1 of this set, The Rainbow Is Yours, effectively shows how the corporate-sponsored product-design films of the 1950s influenced this country by creating an ideal of a modernistic, consumption-driven society.

Volume 2, Capitalist Realism, includes 1930s industrial short films, such as the story of Valley Town, a steel town that fell from prosperity during the Depression. This film, like many others, was part of a publicity campaign to persuade people that corporations would help remedy the joblessness caused by automation.

The Behavior Offensive, Volume 3, documents the social guidance films produced between 1945 and 1960. From Coronet Instructional's *Shy Guy* to Centro Films' *What About Prejudice*, viewers get a rare glimpse of how these movies sought to instruct youth in the nuances of becoming conforming citizens.

Finally, Volume 4, Menace and Jeopardy, examines safety films of the 1940s and 1950s, developed in reaction to the wartime death tolls and intended to prevent accidents in homes and factories.

For anyone interested in film, popular culture, history, or pure nostalgia, these discs are priceless. —*Diane Mehta*

Our Secret Century, Volumes 1-2 and 3-4

$29.95 list per two-volume disc; Voyager; 800/446-2001. Grade: **A**

READER SERVICE NO. 752

WORLDS BEYOND OUR OWN

FOR BEGINNING and more experienced astronomy buffs, **Nine Worlds** provides an eye-opening visual tour of the solar system. Star Trek: The Next Generation star Patrick Stewart lends his distinctive voice

to this multimedia guide, which gathers together a rich array of photographs, video clips, and animated drawings, as well as a series of enlightening interviews with professional astronomers.

Nine Worlds lets you explore specific planets, read about planetary observation and science through the lens of history, and tap into a helpful resource section that includes advice on how to buy a telescope. You also get a small selection of astronomy-based shareware.

A fine design organizes the content.

STAR TREK LUMINARY Patrick Stewart provides narration for Nine Planets' lively exploration of the solar system.

Control panels suggest a graceful steel construction on the deck of a space station. Background music and sound effects enhance the experience. Observational tools on the CD-ROM are light-years ahead of those supplied in books and television documentaries. To check a planet's surface temperature, for instance, you simply drag and drop a thermometer icon onto a graphic of the planet.

The program also explains the ways different cultures have interpreted the sky—from the pre-Columbian Maya of Meso-America to scientists working with the Hubble Space Telescope, and it illuminates astronomy's development over the centuries. Add a night sky guidebook and a decent telescope, and you'll have everything you need to embark on planetary peregrinations. —*Peter Scisco*

Nine Worlds

$39.95 list; Palladium Interactive; 800/910-2696. Grade: **B**

READER SERVICE NO. 753

HOME IMPROVEMENT

WHO NEEDS "This Old House" when you have this old mouse? As every homeowner knows, something always needs fixing, be it a leaky faucet or a lousy paint job. So a good multimedia program illustrating how to make repairs would be a godsend. Now three CD-ROMs promise divine succor: Philips Media's Better Homes and Gardens 101 Weekend Projects, Microsoft's Reader's Digest Complete Do-It-Yourself Guide, and Parsons' Black & Decker Everyday Home Repair.

With its step-by-step video clips, **Better Homes and Gardens 101 Weekend Projects** goes beyond conventional home improvement magazines and books, allowing you to observe exactly how to create a faux-marble finish, say, or cover an ottoman or design a space-efficient closet. It even one-ups how-to TV programs: If you want to see a step again, click for instant replay. Once you're ready to leave the comfort of your monitor and get to work, you can print instructions, lists of materials, and diagrams for building anything from a birdhouse to an art deco bookcase.

While some projects are more ambitious than others (you might want to start with lampshade painting and save building the garden shed for next summer), instructions for all of them are laid out so thoroughly that even the novice do-it-yourselfer won't panic. The title doesn't pretend to be comprehensive. But it will give you the confidence to tackle any of the jobs it covers.

Reader's Digest Complete Do-It-Yourself Guide, based on the *Reader's Digest New Complete Do-It-Yourself Manual*, and **Black & Decker Everyday Home Repair**, compiled from the *Black & Decker Home Improvement Library*, fall short of the mark. Of the two, Reader's Digest's is the more ambitious. What it lacks in simplicity, it compensates for in depth—leaving no how-to nook or cranny untouched. For example, the information on replacing exterior caulking or repairing a chimney is comprehensive; but attempting each project involves wading through vast drifts of text. And though the disc includes 65 video clips, these are hard to find. As a result, despite the CD-ROM's efforts to make the instructions friendly, with folksy music and amiable tour guides, it's easy to get lost.

Similarly, the Black & Decker disc fails to simplify admittedly difficult repair jobs. Video clips are wasted on chatty pep talks that offer little information. Instead, photographs (which you could get from a book) illustrate complicated tasks like plastering a hole in the wall. The explanations are equally frustrating: They're loaded with professional terms that confuse rather than clarify. (There's a glossary, but you must interrupt the lesson to get to it.) As they say in the trade, back to the drawing board. —*Leslie Crawford*

Better Homes and Gardens 101 Weekend Projects

$39.99 list ($45.95 with related book); Philips Media; 800/883-3767. Grade: **A**

READER SERVICE NO. 754

Reader's Digest Complete Do-It-Yourself Guide

$34.95 street; Microsoft; 800/426-9400. Grade: **C+**

READER SERVICE NO. 755

Black & Decker Everyday Home Repairs

$29 list; Parsons Technology/Intuit; 800/223-6925. Grade: **C**

READER SERVICE NO. 756 ■

BRING A GARDEN into your home with a weekend project from the Better Homes and Gardens disc.

Is Your Computer Sound Asleep?

HERE'S YOUR WAKE-UP CALL. Yamaha **WaveForce** sound upgrade cards will shock your old sound card to life like six cups of double espresso, double caff.

WaveForce upgrade cards replace the outdated music functions of your sound card. Now you get 4MB of wavetable sounds right out of professional Yamaha keyboards. Plus three on-board professional digital effects processors. And the control and extra features of the Yamaha XG MIDI format. So every nuance of music and games are dramatically reproduced. And General MIDI software sounds better than ever.

If you have a sound card with a WaveBlaster™ connector, choose the DB50XG daughter board. Or, if your PC has an available card slot, fill it with the SW60XG and get better sound quality than an audio CD. The SW60XG includes 18-bit digital to analog converters (DAC). Compared to the 16-bit sound of audio CDs and the 16-bit DAC of other sound cards, the SW60XG doubles and then doubles again the dynamic range. You'll hear louder louds, softer softs, less noise and incomparable performance.

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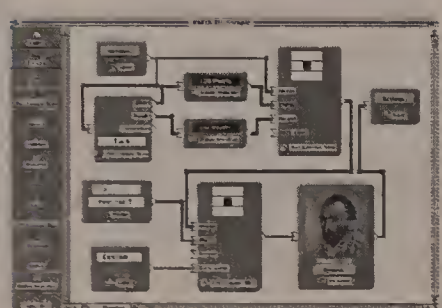
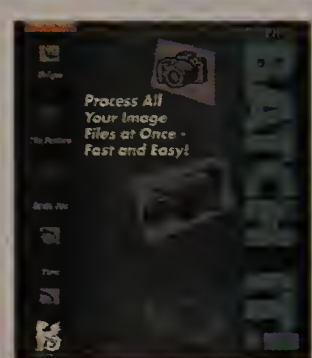
Batch It! is available as a hybrid CD-ROM for Macintosh®, PPC, Windows® 3.1 & Windows® '95.





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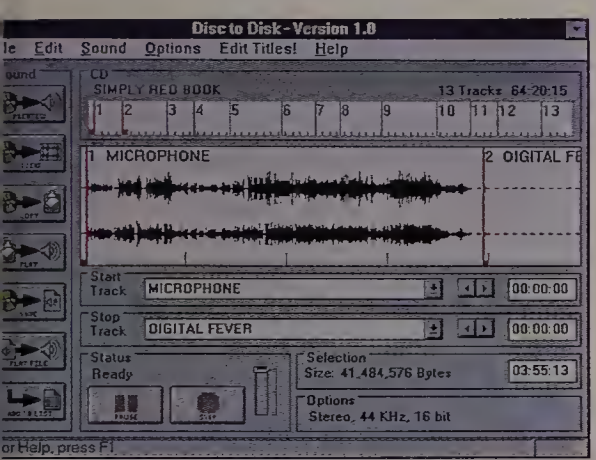
Circle 98 on reader service card

AUDIO

I HAVE A PENTIUM-120 with a CD-ROM drive and a wavetable sound card. I also have an audio CD, which includes a song containing 2 minutes of music that I want to extract and save as a sound file. Finally, I want the 2-minute segment to play continuously. Is there a way to accomplish this on my PC?

Ron Velten, Scarsdale, New York

THE HARDEST PART OF THE JOB you want to do involves getting the 2 minutes of music off the CD and into your computer. My son accomplished this (with an annoying passage from a Nirvana disc that, against my will, I now know by heart) in very primitive fashion, by holding a microphone against a speaker and using Windows' Sound Recorder to record the music. Of course, you won't get great sound quality or balanced stereo this way—but with Nirvana, at least, I doubt that it matters a whole lot.



DISC-TO-DISK'S UTILITIES let you copy audio files from an audio CD to your hard drive—if you have a SCSI CD-ROM drive.

Fortunately, three utilities offer alternatives: Disc-to-Disk, Sound Impression, and Sound Forge XP. Disc-to-Disk for Windows, at $99, copies audio files from a SCSI CD-ROM drive to your hard drive. You can then save the file in WAV, QuickTime, or other format. But Disc-to-Disk doesn't work with IDE CD-ROM drives, which predominate in prepackaged off-the-shelf multimedia systems.

Sound Impression, a utility from Midisoft (800/776-6434), can handle both SCSI and IDE CD-ROM drives, but this Windows program hasn't been updated since 1994 and doesn't have the range of tools you'll find in Disc-to-Disk. On the other hand, it costs only $35, and it does work under Windows 95.

USE SOUND FORGE TO RECORD music from any source and master it with various effects and processing tools.

Sound Forge, which is produced by Sonic Foundry (800/577-6642), doesn't directly access the CD-ROM drive; but if the drive is connected to your sound card, it can record whatever you play. The drawback is that you might lose some audio quality as the sound is converted to analog, and then back to digital. The $149 Sound Forge also includes an array of solid editing and special effects tools.

IN JUNE 1995 I PURCHASED a 90-MHz Pentium system equipped with 8MB of RAM and an ESS ES688 sound card on the system board. The machine also came with Windows 3.1 preinstalled. A few months later, I upgraded the sound card to a Creative Labs Sound Blaster AWE32, which worked just fine. Then, in January 1996 I upgraded to Windows 95. Ever since, I have had problems with fluttering audio and stuttering video clips when I run various multimedia applications. For example, the sound of the clips included on the Windows 95 CD-ROM flutters; and the accompanying video features less-than-desirable resolution, as well as pausing intermittently. When I exit the clip, the music briefly continues to play (with no sound problems) after the video playback has ended.

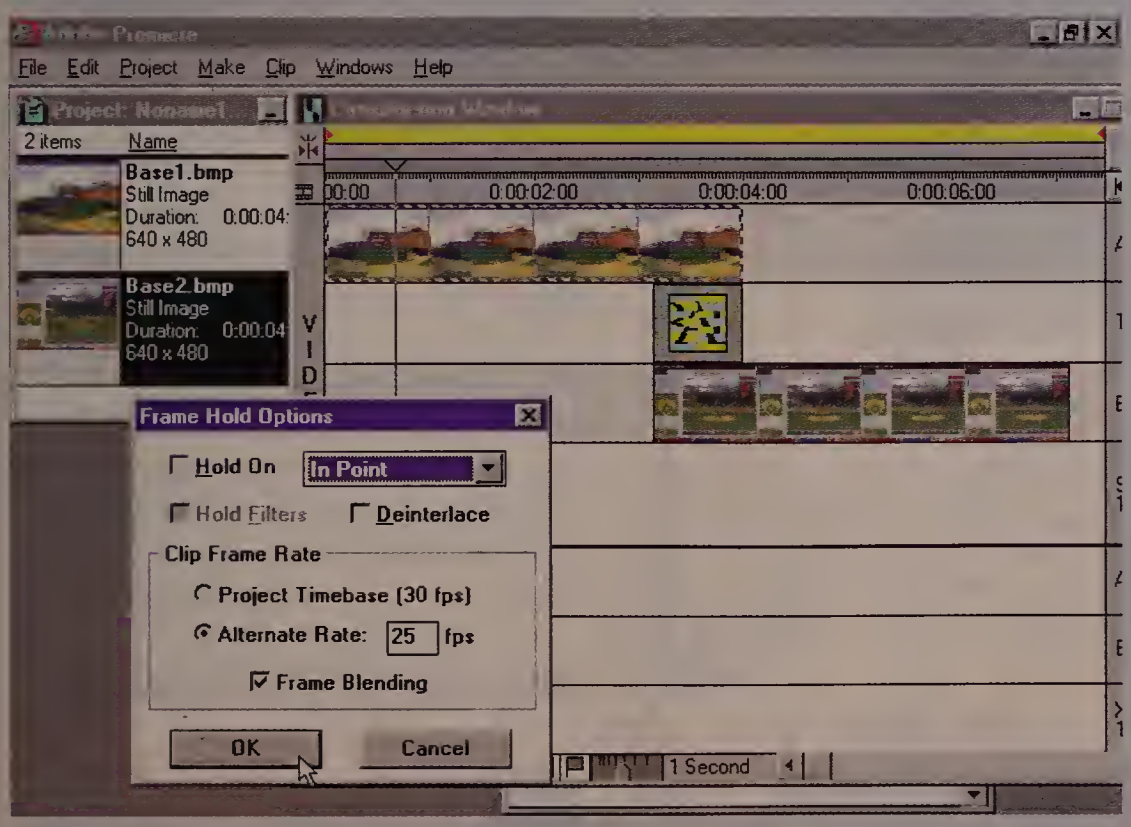
Terry Kimble, Topeka, Kansas

EVIDENTLY YOU RUN into difficulty only when playing videos with sound. This type of fluttering, jerky video happens when a system is struggling to synchronize the speed of the sound with the speed of the video. If the speeds fall out of sync (because the video lags behind the audio), Windows drops frames from the video to enable it to catch up.

Solution of the Month

ARE YOUR ADOBE PREMIERE CLIPS JERKY, especially when you use slow-motion effects? To make them run smoothly, first slow down the frame rate; then go to the Frame Hold Options dialog box and click the Frame Blending box. This will establish a fluid transition from one frame to the next.

Richard Anderson, Chicago



AFTER YOU CLICK THE OK button, playback will smooth noticeably.

Your problem may be due to any of several causes. First, since AVI and WAV files are CPU- and memory-intensive, your woes could stem from your having insufficient memory, even with 8MB. Make sure no other applications are running, and try the video clip again. If it plays more smoothly, you can probably improve your system's performance and run additional applications by adding memory.

If that doesn't solve your problem, try copying the video file in question from the Windows CD-ROM to your hard drive. If playback improves when you subsequently run the clip from the hard drive, you need a new, faster CD-ROM drive.

Next, make sure that the driver for your video card is up to date. Call your video card's manufacturer to identify the latest driver. You can check the date of your current driver by opening the Windows/System subdirectory, right-clicking the file name, and selecting Properties from the pop-up menu. If you don't happen to know your current video driver's file name, double-click Display in Control Panel; then click the Settings tab followed by the Change Display Type button.

THE THREE LIKELIEST CAUSES of fluttering video clips are low memory, a slow CD-ROM drive, and uncooperative video drivers.

If the problem persists or if you have sound problems when not running video, make sure you're using the Sound Blaster driver for Windows 95, and check your IRQs and memory settings to ensure there are no conflicts with other equipment. You do this by going to the Control Panel, double-clicking System, and then selecting the Device Manager tab. Device Manager is supposed to alert you to any conflicts for the selected device (click the Properties button, and then the Resources tab); but in my experience, it has often failed to report an existing conflict. The safest course is to make your own list of the settings for all your equipment directly from the equipment itself and then compare these settings with the ones listed in Device Manager. If you have a conflict, consult the manuals for your devices to determine how to change their settings. Even better, call Creative Labs and download its latest driver. The company's BBS is 405/742-6660. You can visit its Web page at http://www.creativelabs.com.

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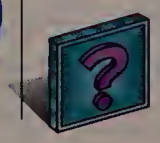
VIDEO



I HAVE A COMPAQ PRESARIO 9536 with an S3 Trio 64V+ video card and a Scenic/MX2 MPEG

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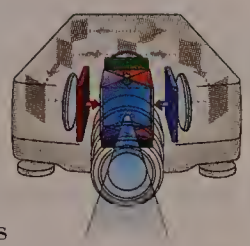
MACUSER EDITORS' CHOICE AWARD 1995 FINALIST

PRESENTER'S CHOICE Presentations Magazine



Epson's Prism Technology, and 3 advanced LCD's (not just 1) produce the brightest, high-quality images.

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decoder. Since I upgraded from Windows 3.1 to Windows 95, I can no longer play MPEG videos. I installed Compaq's driver update for Windows 95, which was supposed to update all my drivers, but it didn't work. Now when I try to play MPEG videos, I get a System Device Error message. I also downloaded the generic drivers from S3; these work for my video card, but not for the MPEG device. I know my computer can play MPEG, but how can I get it to work in Windows 95?

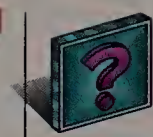
Erica Heth, Chicago

THE SUPPORT STAFF at S3 recommends against using generic drivers for subsystems on Compaq computers, unless you receive instructions to do so from Compaq support technicians. That's because Compaq rewrites the BIOS code for many of the subsystems it incorporates, necessitating the use of proprietary drivers for these components. This warning would apply to the video drivers you've downloaded—although they seem to be working for you—as well as to any MPEG decoder drivers.

Compaq's tech support staffers were unable to determine the cause of your problems from the description you provided, but they suggested that you may be able to resolve it by removing and reinstalling Compaq's Windows 95 drivers.

To obtain a new set of Compaq-supplied drivers, you can call Compaq's bulletin board at 713/518-1418 or visit its Web site (http://www.compaq.com) and download two files: SP1417 for the video drivers and SP1441 for the MPEG drivers.

For readers whose systems use off-the-shelf components, S3's Web site at http://www.s3.com offers drivers for numerous products and operating environments. This page has links to S3's FTP server; try the pub/bbs/mxdrv directory and look for a file named cw952206.zip—at press time the current file for the Scenic/MX2 MPEG decoder operating under Windows 95. Again, it's best not to try these drivers with Compaq systems unless Compaq recommends it.



OVER A YEAR AGO, I bought a Reveal TV card—the TV300—for displaying TV broadcasts on my computer monitor. It worked great in Windows 3.1, but not in Windows 95 because there are no drivers. When I checked the Reveal forum on CompuServe (go reveal) and the Reveal Web site (http://www.reveal.com) I discovered that drivers are available for the TV500 model, but not for the TV300. I like the card and don't want to buy a new one. Is there any way I can get it to work with Windows 95?

Colin Mason, Atlanta

SORRY TO BE THE BEARER of bad news, but if you want to work in Windows 95 you'll have to give your TV300 the old heave-ho. Reveal doesn't have Windows 95 drivers for the card, and it doesn't plan to introduce any. In fact, Reveal hasn't sold the TV300 through its normal retail channels since late 1994.

The TV500, meanwhile, tips the scales at a list price of $249; and alas, the company offers no special discount to TV300 owners who want to upgrade. You can reach Reveal at 800/326-2222. ■

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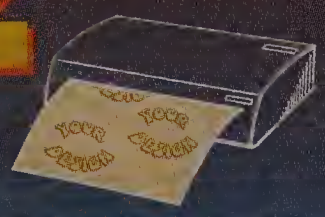

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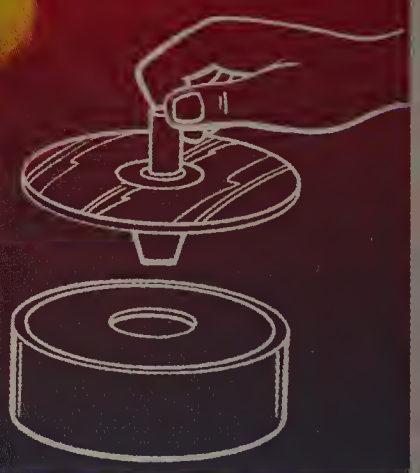

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PC WORLD

TOP 5 SOUND BOARDS

	Product	Last reviewed	Street price	Overall rating	Audio score	Comments	Reader service number
1	Creative Labs Sound Blaster AWE32 PnP 800/998-5227 http://www.creativelabs.com	June 96	$250	92	92	**FEATURES:** Plug and Play, 512K of RAM expandable to 28MB for downloadable MIDI sounds, DSP for MIDI effects, Sound Font editing software, IDE interface. **PROS/CONS:** Top-quality wavetable sound, flexible MIDI composition software, trouble-free installation, good frequency response; noisy microphone input.	655
2	CrystaLake Model 110 503/222-2603 http://www.crystalake.com	Aug 96	$169	92	87	**FEATURES:** Plug and Play, 3-D sound with fully adjustable center fill and effect depth, stereo microphone input, IDE interface. **PROS/CONS:** High-quality wavetable MIDI sound, realistic 3-D effects, low noise, good frequency response, inexpensive, three-year warranty; no reverb or chorus.	656
3	CrystaLake Model 140 503/222-2603 http://www.crystalake.com	June 96	$269	90	87	**FEATURES:** Plug and Play, 3-D sound with fully adjustable center fill and effect depth, reverb and chorus, stereo microphone input, IDE interface. **PROS/CONS:** High-quality wavetable MIDI sound, realistic 3-D effects, low noise, good frequency response, good microphone input, three-year warranty; poor cross-talk figures.	657
4	Advanced Gravis UltraSound Plug & Play Pro 800/663-8558 http://www.gravis.com	May 96	$199	89	85	**FEATURES:** Plug and Play, 512K of RAM upgradable to 8MB, IDE interface. **PROS/CONS:** Excellent audio performance, good microphone input, professional-grade wave editing and MIDI software; mediocre MIDI sounds, awkward procedures for switching game and MIDI modes in DOS.	658
5	Creative Labs Sound Blaster 32 800/998-5227 http://www.creativelabs.com	May 96	$170	89	90	**FEATURES:** Plug and Play, 0K of RAM expandable to 28MB for downloadable MIDI sounds, IDE interface. **PROS/CONS:** Top-quality wavetable sound, good frequency response for wave playback and line input recording, inexpensive, trouble-free installation, clear documentation; poor frequency response on microphone input.	659

THIS MONTH WE TESTED TURTLE BEACH SYSTEMS' TROPEZ PLUS. Despite being a top-end sound board, the Tropez Plus could not break into our Top 5. It features full game compatibility, Plug and Play installation, and 4MB of wavetable instrument sound. Installation is easy, but if you want to play DOS games, you'll have to edit a DOS shortcut icon to make them work the first time. On our lab tests for wave playback and line-level recording, the Tropez Plus achieved the best results of any sound board we've recently tested. But recording quality from the microphone input is dismal due to excessive noise and extremely poor frequency response.

METHODOLOGY: All boards are tested on an Audio System Precision 2 workstation to determine frequency response, cross talk, noise and distortion, and other characteristics. We judge MIDI and wave audio quality by comparing sample sounds against original source material on DAT. Overall ratings are based on performance (40 percent), features (25 percent), price (25 percent), and support (10 percent). For all ratings, higher is better. Data are based on tests designed and conducted by the PC World Test Center. All rights reserved. For more information about all products in this table, circle reader service no. 906.

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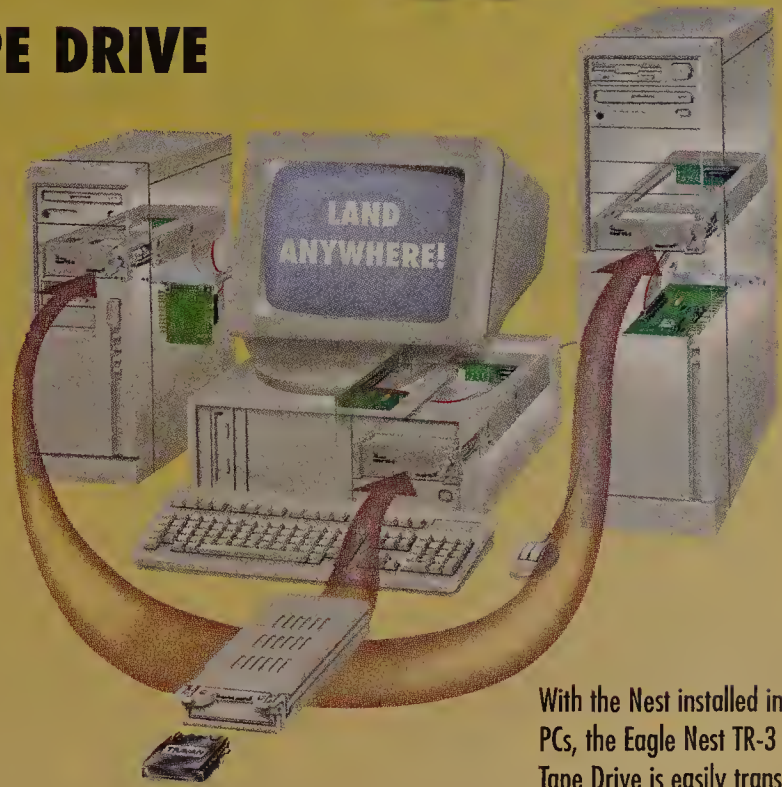

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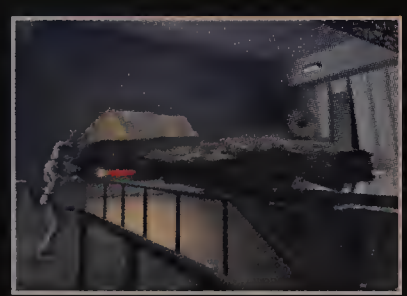

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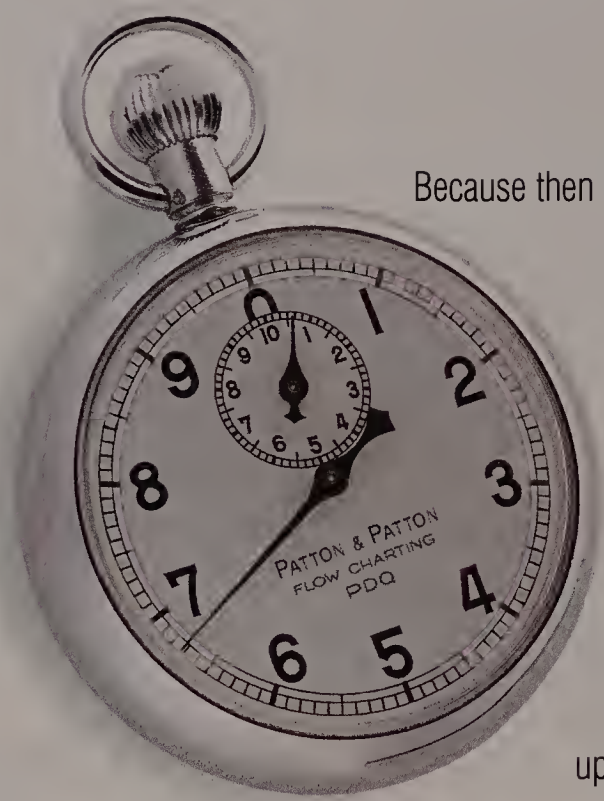

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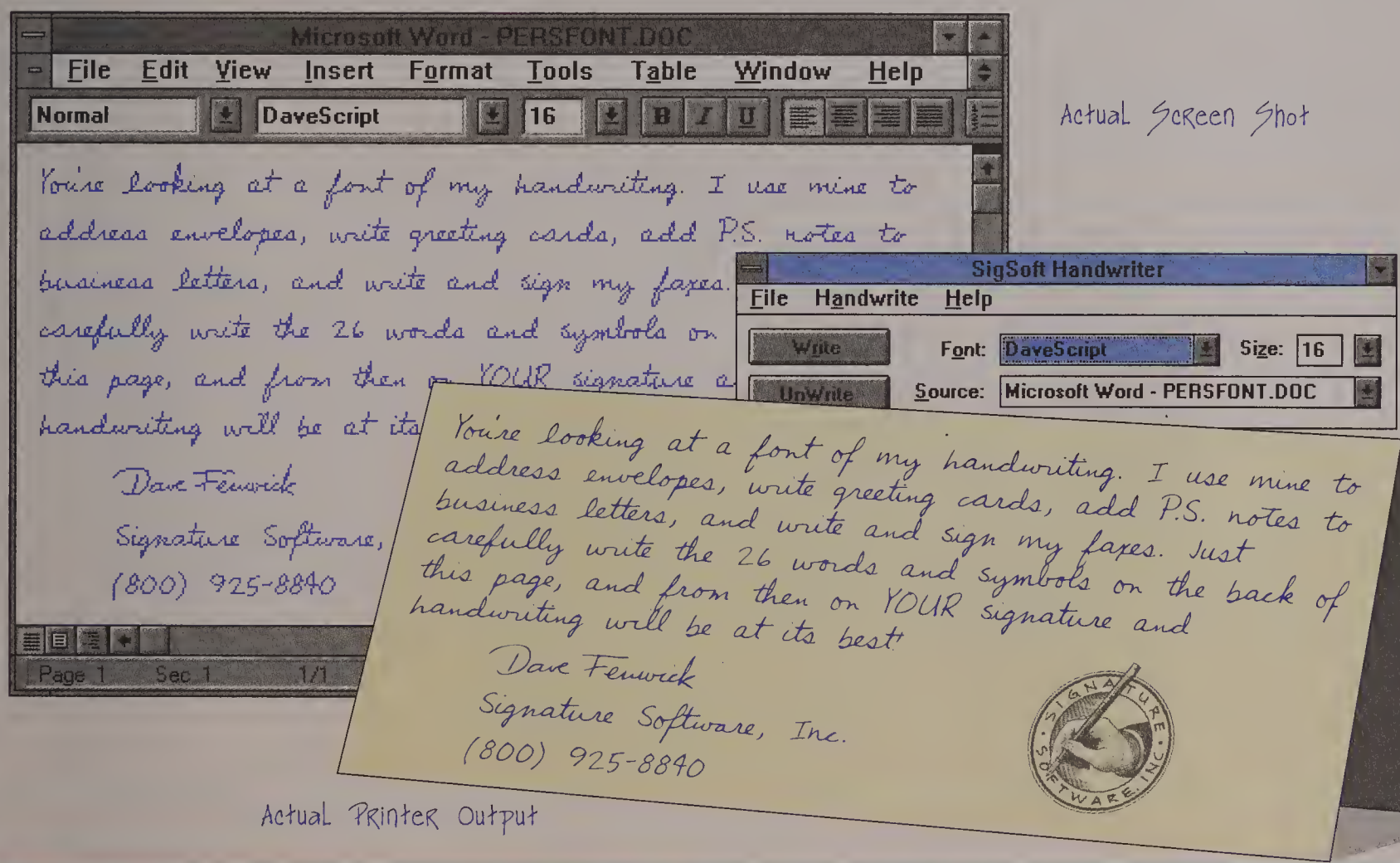

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☐ **3. Write your signature in the Signature box.** Try to fit the signature within the box. Separate the parts of your name if you wish to use them individually from the font.

☐ **4. Begin the 26 words with lower case letters.** Use the broken lines as a base line and the grid lines to help size your letters, but don't write too small.

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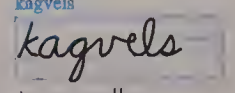

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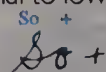

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HERE'S HOW

REAL PROBLEM. REAL SOLUTION

I can't get ISDN. Isn't there another way to get quick access to the Web? —*Brad Wood*

BRAD WOOD NEEDED A FAST WAY TO GET ONTO THE WEB—and not just from work.

IF DIAL-UP ACCESS to the Internet seems like crawling through mud, and higher-speed ISDN service is unavailable or too expensive, who are you going to call?

ISDN wasn't an option for Brad Wood, a communications engineer and project manager with Sandia National Laboratory in Albuquerque, New Mexico, as his local phone company charged an eye-popping $400 a month for the service. This month Wood tells us about a satellite hookup to the Net that made more sense for him. —*Editor*

PROBLEM: GET ON THE WEB FAST, WITHOUT ISDN

ANYONE WHO SURFS the Net knows that tapping into the World Wide Web with a 28.8-kilobits-per-second modem is about as much fun as skinning a porcupine.

As a communications engineer, project manager, and researcher studying security technologies for a national laboratory, I have a job that *depends* on how fast I can surf. My colleagues and customers—including the U.S. Department of State, the U.S. Department of Energy, and private corporations—call on me for the latest information on security technologies. I collect almost all of this information via e-mail, newsgroups, FTP, and Web sites.

Back in the good old days of 1994, I did my research in off-hours at home, using a 14.4-kbps modem connected to an IBM ThinkPad notebook. It didn't take me long to notice that as more and more nontextual information became available on the Web, access became painfully slow. As I called up Web sites and downloaded graphics, I found I had to work much harder and longer to get less information.

For years I've been searching for a cost-effective method of surfing the Net from home. I'd been holding out for ISDN because I thought it would be the answer to the speed problem. After all, I use ISDN at work, five miles from my house. However, ISDN service is not readily available throughout most of the Albuquerque metropolitan area. Worse, the service isn't regulated in New Mexico, and US West quoted a fee of more than $400 a month to bring ISDN to my home.

I began sniffing around for other options. Connecting through my office net would have been expensive and slow. I also looked into wireless technology, but my home is just too far from the lab.

SATELLITE SERVICE

ONE DAY I WAS reading an industry publication when I came upon an article about DirecPC, a low-cost, satellite-based Internet service from Hughes Network Systems. I sent an e-mail to the company asking for information.

In a few days I received some literature about the product, and found out that DirecPC supports online software downloading, online video, and a service called Turbo Internet. (At 400 kbps, Turbo Internet is many times faster than my 14.4-kbps dial-up modem.)

I decided to purchase DirecPC, which ran me around $1200. (It now costs $699.) This price included a rooftop satellite dish setup, a receiver on a PC expansion card, and Windows software. The monthly base service charge is $15.95, which includes the first 30MB of material accessed by Turbo Internet.

Hughes Network Systems will set everything up for you for $400, but I took the

do-it-yourself route. The first step was to install the antenna, a 24-inch fiberglass dish that either mounts onto a metal pipe cemented vertically into the ground or fits onto a nonpenetrating, sledlike rooftop mount. I chose the latter, and held the rooftop mount down with concrete blocks.

After setting up the dish, I installed the receiver—a standard ISA expansion card—in my ThinkPad's docking station. My PC ran a Plug and Play setup that configured the hardware automatically.

Installing the software wasn't difficult. I was happy to discover that the Turbo Internet drivers run with the common Trumpet Winsock shareware program (available from Hughes) and FTP Software Corporation's TCP/IP stacks. It also works great with Netscape Navigator, as well as with Internet e-mail systems like Qualcomm's Eudora Pro.

The DirecPC setup program—which includes Explorer and is a kind of satellite-based bulletin board system—helped me direct the satellite dish to the right location. I entered my zip code and, with the help of a compass and an on-screen set of graphical signal-strength readings, I found the satellite with little fine pointing—and with signal quality to spare.

"I'm happily **surfing the Internet** from home at speeds that are far **faster than ISDN.**"

Ever since I installed DirecPC, I've been able to get a lot of good work done fast. To borrow a phrase, DirecPC rips. In fact, it seems as fast as the T3 line at work. Now I can retrieve huge e-mail messages that used to clog my system for hours. I'm spending an average of 12 hours a week searching the Web for mountains of data. To get the same amount of information with my old 14.4-kbps modem would take something like 400 hours—hard to fit into a week!

DirecPC isn't perfect. For one thing, the satellite dish is a receive-only terminal; you still must send data via modem on a dial-up line. If you click on a link within your Web browser, for example, you send the link's address to the Web server over the phone line at whatever speed your modem supports, and the response is routed over the satellite system. And unfortunately, if you work outside the continental United States or Canada, you can't use the system. Finally, the actual satellite receiver is an ISA card; users of Macintoshes and laptops are out of luck. (Hughes recently stopped supporting laptops and docking stations, so I switched to my wife's 486 for Webcrawling.)

But I'm happily surfing the Net from home at speeds that are far faster than ISDN, and DirecPC was easy to set up and run. For someone like me, for whom Net surfing is another part of work, this is by far the fastest, most economical solution.

• DirecPC $699 plus $400 installation and $15.95 per month; Hughes Network Systems; 800/347-3272; http://www.hsn.com

READER SERVICE NO. 660

Edited by Bronwyn Fryer

Bronwyn Fryer is a contributing editor for PC World. *If you use PCs to manage people and other resources in a business environment, we want to hear from you—we pay $300 for published columns. See page 12 for contact information.* ■

SOLUTION: SATELLITE DISH

Dish out your Internet access with a satellite link, which can help you surf faster than anyone on the block. Here are four things you need to know about the DirecPC link.

It's not terribly cheap. It costs $700 and up to install and $16 to thousands per month to use, depending on the services you choose and how long you're online.

The receiver supports PCs only. If you have a Mac or a laptop, you're out of luck.

Your site must be right. You'll need a protected rooftop or yard where you can install the dish.

'Tis better to receive. Downloading takes place at 400 kbps, but uploading still crawls along at analog speeds.

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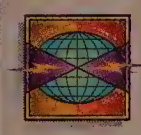

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Repartition or compress? ◆ Disk Manager pros and cons ◆ Take out a new user license

COMPRESS THAT DRIVE WITH DRIVESPACE 3

I HAVE A Pentium system with a 1.6GB hard disk partitioned as a single drive. The hard disk is more than half full, and before it becomes completely full, I'd like to free up some additional room. I know that repartitioning the drive into several smaller logical drives will reduce space wasted in large clusters, but can't I just compress the drive instead?

Ron Vernon, Long Beach, California

REPARTITIONING IS quite a lot of work. First, you have to back up the entire drive, then repartition it, format each of the new logical drives, reinstall Windows, and finally restore your backup.

If you're willing to pay for the convenience, you can use PowerQuest's $50 PartitionMagic utility to shrink your existing partition and create new ones in the resulting free space. Reducing your 1.6GB C: drive to just under 1MB will save you many megabytes of wasted "cluster slack."

But if you're not up to repartitioning, then yes, you can just compress the drive. Disk compression utilities combine all the files on your disk into one large compressed volume file.

If you're using Windows 95 and already own Microsoft Plus, I recommend its DriveSpace 3 utility, which supports compressed volumes as large as 2GB and uses economical 512-byte clusters.

Unavoidably, disk compression does slow your system's performance, because files are compressed and decompressed each time they're written to and read from the hard disk. But on a Pentium system like yours, you shouldn't experience any noticeable slowdown.

If you do, DriveSpace 3 lets your compressed volume file contain both compressed and uncompressed files, so you can choose not to compress applications or documents that you use regularly.

- PartitionMagic $50; PowerQuest Corp.; 800/757-5044; http://www.powerquest.com

READER SERVICE NO. 671

- Microsoft Plus $54.95; Microsoft Corp.; 800/426-9400; http://www.microsoft.com

READER SERVICE NO. 672

SHOULD I DUMP DISK MANAGER?

MY SYSTEM IS RUNNING Windows 95, and I just upgraded to a new 1.2GB hard drive. My computer's relatively old BIOS recognizes only 500MB of the new drive, so I installed Ontrack's Disk Manager software to make the entire drive visible. Is there any risk in using disk management software? I recently had some boot-up problems that caused my hard drive to vanish temporarily.

John Lanzelotti, Orlando, Florida

THERE'S NO SERIOUS danger in using Disk Manager or any other drive geometry "shim" utility, as long as you take the proper steps when repartitioning or moving your drives.

The main problem occurs when you install a drive as a slave in a two-drive system, partition it with Disk Manager (which installs the hidden Disk Manager software on the master drive), and then swap the two drives. When you attempt to boot the computer with the new drive, you'll receive an error message saying that the partitioned drive is unreadable: The Disk Manager software is no longer on the boot drive and hence isn't loaded.

Disk Manager won't affect performance, and as long as you have version 7.03 or later, it should work without a hitch with Windows 95. My only gripe with utilities like Disk Manager is that they insert an extra layer of complexity into configuring your hardware. New hard disks and controllers remove much of this complexity: Just plug them in, and with a few exceptions, the rest is automatic.

If you're planning on upgrading your system board, BIOS, or disk controller—any of which will likely allow you to transcend the 1024-cylinder/512MB hard disk ceiling—you should remove Disk Manager. That's simple enough: Back up your hard disk, partition and format it with the fdisk and format commands, and then restore your backup.

CHANGING YOUR IDENTITY IN WINDOWS 95

THE NOVEMBER 1995 *Help Line* explained how to change the licensed user information stored in Windows 3.*x* and Windows for Workgroups ["A Change of Identity"]. I'd like to do the same thing in Windows 95.

I've tried editing the contents of the serialno.ini file mentioned in November's ▶

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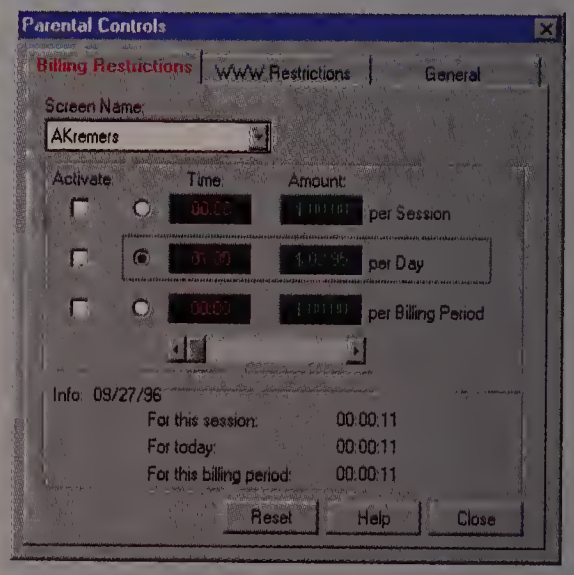

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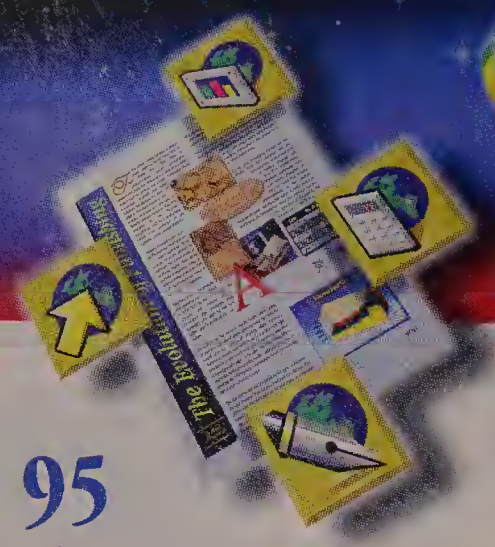

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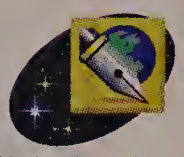

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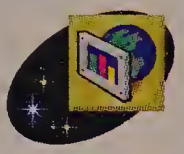

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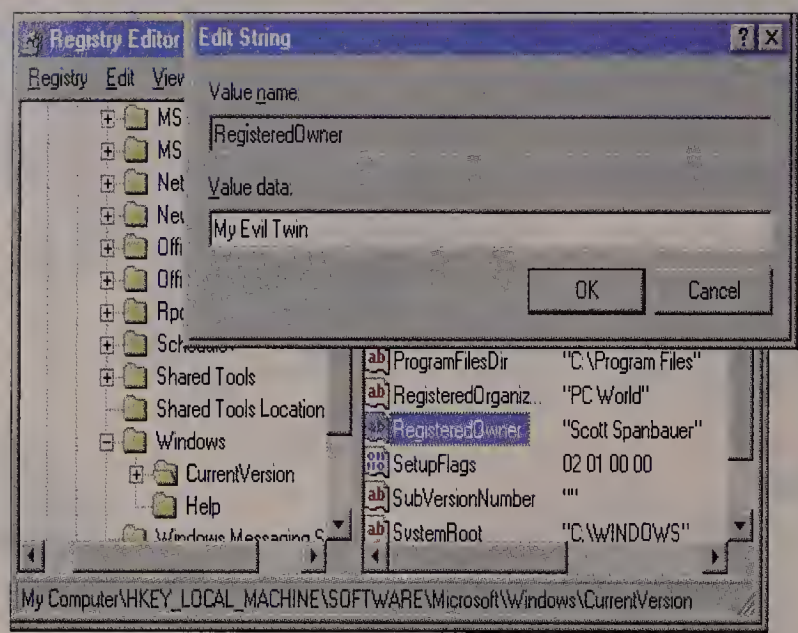


FIGURE 1: IF YOU'VE INHERITED A PC, you can change the licensed user information by editing the Windows Registry.

column, but it has no effect on the name displayed in the About Windows dialog box.

Gary Ware, Towanda, Kansas

JUST WHEN YOU were beginning to master the art of .ini file editing—*wham!* It's a paradigm shift.

As you've probably heard a zillion times by now, Windows 95 and applications that are built for it store most of their configuration settings in the Registry rather than in .ini files. The Registry can be highly confusing, and Microsoft clearly didn't intend for the average user to start mucking around in it.

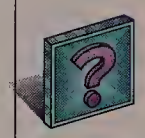
To change the licensed user data stored in the Registry, which you may want to do if you inherited your PC from someone else, follow the steps outlined below.

1. Back up these files in the Windows folder: user.dat, user.dao, system.dat, and system.dao. If you don't see these files, choose *View•Options* in My Computer or Explorer, click the *View* tab, select *Show all files,* and then click *OK.*
2. Select *Start•Run,* type **regedit** in the Open box of the Run dialog box, and click *OK* to launch the Registry Editor.
3. Select *Edit•Find* in the Registry Editor dialog box, enter **RegisteredOwner** in the Find What field of the Find dialog box, make sure the *Values* check box is selected, and then click the *Find Next* button.
4. Double-click *RegisteredOwner* in the right-hand pane of the Registry Editor; then in the resulting dialog box, replace the contents of the 'Value data' field with whatever you want (see **FIGURE 1**). Click *OK* and exit the Registry Editor.

Select *Help•About Windows 95* in the Control Panel to see the alteration you've made. To change the organization you're listed under, follow the same steps for RegisteredOrganization.

Note that these changes will not be reflected in your regular applications.

SKIP SCHEDULE+ LOG-ON



I WANT TO PUT a Shortcut to Schedule+ in my Startup folder so I can see my schedule whenever I start Windows 95. Unfortunately, Schedule+ asks for a user name and a password each time it starts up, and it doesn't appear to accept any command-line parameters.

I managed to prevent the password dialog box from appearing by making the password blank. But I still have to click OK or press <Enter> to accept the user name (which appears automatically in the Schedule+ log-on dialog box). Is there some way to automate the entire process?

Dan Liggett, Internet

IT WOULD HAVE BEEN SO easy to add this little tidbit to the program's documentation or on-screen help, but no, you have to do it yourself.

Right-click the *Start* button, select *Explore,* and navigate to your Schedule+ Shortcut (you'll find it in c:\windows\start menu\programs). Right-click the Shortcut, select *Properties,* and click the *Shortcut* tab. To the end of the Target command line, add **/U *username***, as in **FIGURE 2**. You can also add **/P password** to launch a password-protected Schedule+ file.

Obviously, anyone with access to your computer can open your Schedule+ calendar, but no one can read the file from another networked computer. ■

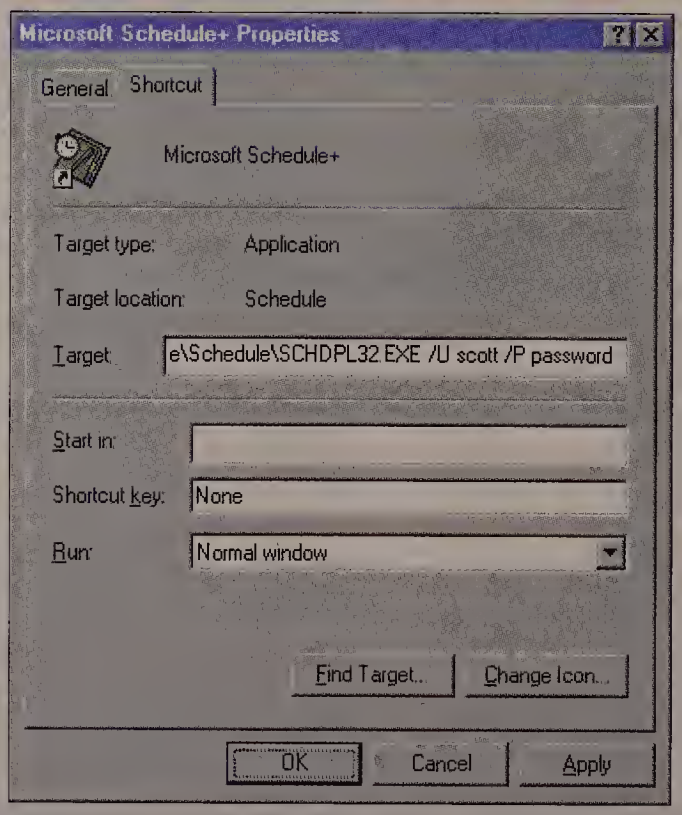


FIGURE 2: BYPASS SCHEDULE+ PROMPTS by adding commands to its Shortcut properties.

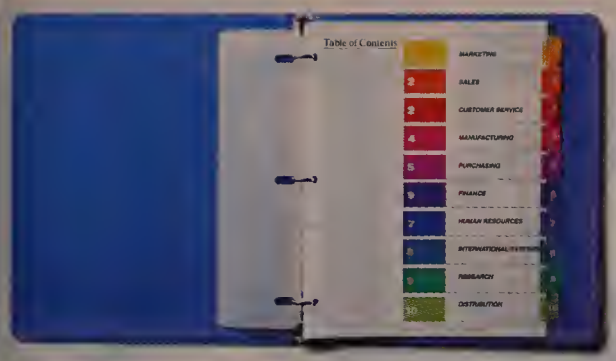
A More Exact Extract

AS MENTIONED IN April's *Help Line,* the extract tool can be used to copy Windows' compressed installation files from .cab (cabinet) files ["Pulling System Files From Cabinets"]. Your explanation left out one important command-line parameter, /a, which allows you to search all cabinet files for a particular compressed file with only one command. For example, the command **extract /a /y c:\windows\system d:\win95\ win95_02.cab comdlg32.dll** searches win95_02.cab and all subsequent sequentially numbered .cab files for the file comdlg32.dll.

Furthermore, the command **extract /a /d d:\win95\ win95_02.cab *filename*** likewise searches each sequential .cab file starting with win95_02.cab for the file you type in place of *filename.* And it does all this in DOS, which is much faster than any Explorer add-on.

Brad Goodwin, Soquel, California

Find files from this article and additional tips at http://www.pcworld.com/hereshow.html. Answer Line *welcomes your questions and tips and pays $50 for published items. Scott Spanbauer is a* PC World *contributing editor and author of* The No B.S. Guide to Windows 95 *(No Starch Press, 1996, 800/420-7240).* *See page 12 for contact information.*



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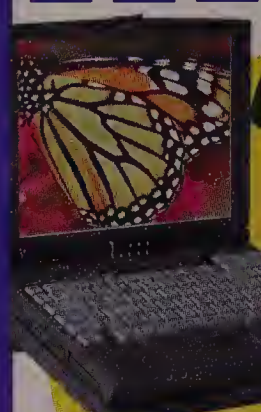

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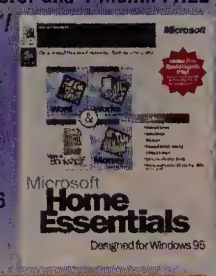

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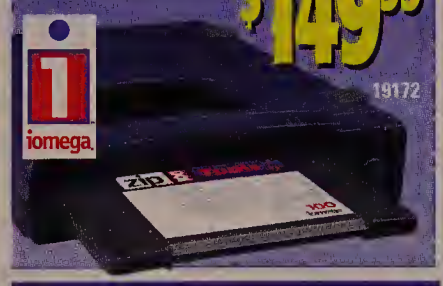

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Paste Without Waste, Calculate Square Roots

WINDOWS 3.X AND 95

YOU'RE TYPING ALONG in WordPad (Windows 95) or Windows Write (Windows 3.*x*) and decide you need a special character from the Wingdings font—maybe a fancy bullet or a tiny icon. You launch Windows Character Map, select Wingdings from the Font list, double-click the character you want, click Copy, switch back to your application, and paste.

Oops! That's not what you selected! Well, it is—but it's the wrong font and the wrong size.

The problem is that the Wingdings font doesn't export its format correctly from Character Map. With Write the problem gets worse: It's difficult to paste any formatting information from other applications into Write. For example, if you're pasting 24-point BlippoBlack from Microsoft Word into a Write document formatted with 12-point Arial, chances are you'll get 12-point Arial, just like the rest of your document. Sometimes that's okay. Sometimes it's not.

What to do? You could select each item you paste and manually reapply the formatting and font you need. This is easy enough for WordPad users—just select a font from the Format Bar. And if you're not dealing with Wingdings, you can control the format of pasted text by choosing *Edit•Paste Special*. When you want to be sure the imported text retains its original size and typeface, select *Formatted Text (RTF)* in the Paste Special dialog box and click *OK*. When you want the pasted text to adopt the formatting of its new context, select *Unformatted Text* and click *OK*.

Write users can manually reformat text by choosing Character•Fonts, but this gets painfully slow if you're pasting a lot of special characters. Here's a solution: At the end of your document, create one line in each font you'll want for imported text. Then when you need, say, a Wingdings character, just jump to the end of your document and paste the character in the Wingdings line. Select it and choose *Edit•Cut* (or press **<Ctrl>-X**). Then move to where you want the character and paste it again—and enjoy a real change of paste.

THE ROOT OF THE PROBLEM IN CALCULATOR

IF YOU USE the Windows Calculator program, you may have been stymied (and surprised) by its lack of a square root button in Scientific mode. To see what I mean, launch Calculator and choose *View•Standard*. The sqrt button is plainly visible near the upper right corner. But choose *View•Scientific*, and the button disappears. The problem and solution are the same in both the Windows 3.1 and Windows 95 versions of Calculator. Although it requires a few more keystrokes or mouse clicks, you can still calculate a square root in Scientific mode without jumping through too many hoops.

First, enter as you usually would a number for which you need the square root. Then select the *Inv* check box and click the *x^2* button. For the keyboard equivalent, press **I** followed by **@**. If that's too many keystrokes, you can always use Windows Recorder in Windows 3.*x* to shorten the steps to a single function key.

Divide Your Desktop, Boot Directly to DOS

WINDOWS 95

IF YOUR WINDOWS 95 Desktop is a mess of files, folders, and Shortcuts, create wallpaper that divides the Desktop into useful categories—inbox, outbox, or whatever you want (see **FIGURE 1**).

To create wallpaper that fills your screen, you first need to know the size of your Desktop (this is also known as your screen resolution).

Right-click the Desktop and choose *Properties*. Click the *Settings* tab, and in the Desktop Area look for the line that says something like "800 by 600 pixels" or "1024 by 768 pixels." Make a note of these numbers, then click *Cancel*.

Next, start Paint and choose *Image•Attributes* or press **<Ctrl>-E**. Then, under Units, click *Pels*.

In the Width and Height boxes, type, in the same order, the numbers you saw in the Desktop properties sheet.

FIGURE 1: ORGANIZE YOUR WINDOWS 95 DESKTOP with creatively compartmentalized wallpaper.

The next step is to divide up your canvas, creating circles, boxes, or other delimiters, using the appropriate Paint tools. Use the text tool to label your categories.

When you're finished, go ahead and save the file, and then choose *File•Set As Wallpaper (Centered)*.

Exit Paint and move your icons into the proper locations. Voilà! Now all you have to do is remember to keep *this* desk clean. ▶

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CUSTOM START-UPS

IF YOU FIND yourself switching to MS-DOS mode as soon as you start Windows 95, you can avoid the agonizing wait while Windows loads and boot directly to DOS by editing the msdos.sys file. You can make Windows start in MS-DOS mode, start with your previous version of DOS, or start with a menu of options.

Pretty handy, yes?

Here's how: First, using My Computer or Explorer, find a file called msdos.sys in the root (the topmost folder) of your C: drive. (If you don't see it, choose *View•Options*, select the *View* tab, then click *Show all files* and then *OK*.) If you're using DriveSpace or other disk compression software, you'll need to find the version of this file that's on your host drive (E:, H:, or some other drive letter in Explorer or My Computer).

Once you've found the file, safeguard it by making a backup copy.

Next, right-click *msdos.sys* and choose *Properties* (or select the file name and press **<Alt>-<Enter>**). Uncheck the *Read-only* check box and click *OK*. Right-click *msdos.sys* and choose *Open With*. Select *Notepad* or another text editor from the list, and click *OK*.

Once inside, take a look around. Find the [Options] line; you'll make all your changes underneath this heading.

Don't mess with the series of 'xxx...' lines you'll find at the bottom of the file; they ensure that the msdos.sys file is large enough for applications that expect it to be at least 1024 bytes.

Look for a line that begins BootGUI=1. To force Windows into MS-DOS mode, change this line to read **BootGUI=0**. If you don't see the BootGUI=1 line, go ahead and add a line that reads BootGUI=0.

Now, when you switch on your machine, Windows will start in MS-DOS mode. When you want Windows 95, just type **win** at the DOS prompt.

However, if you upgraded from DOS or Windows 3.*x* and want to start in your previous version of DOS, add a line that reads **BootMulti=1** to msdos.sys. Thereafter, pressing **<F4>** when you see the 'Starting Windows' message on your screen will make your PC boot to your earlier version of DOS. If you need to change these settings once you're in your old DOS, you'll have to edit msdos.w40 (not msdos.sys).

If you just want to see the menu of possible start-up options when you turn on your computer, add the line **BootMenu=1** to msdos.sys. This will make the menu appear for something like 30 seconds when you start up your PC.

If you don't press a key, Windows 95 will start in the normal way. If you can't see the menu because of the Windows start-up graphic, add a line that reads **Logo=0**.

If you don't want the menu to appear automatically, add the **BootMulti=1** line as instructed above and then press **<F8>** to make the menu appear when your screen says 'Starting Windows'. If you don't press a key, Windows 95 will start.

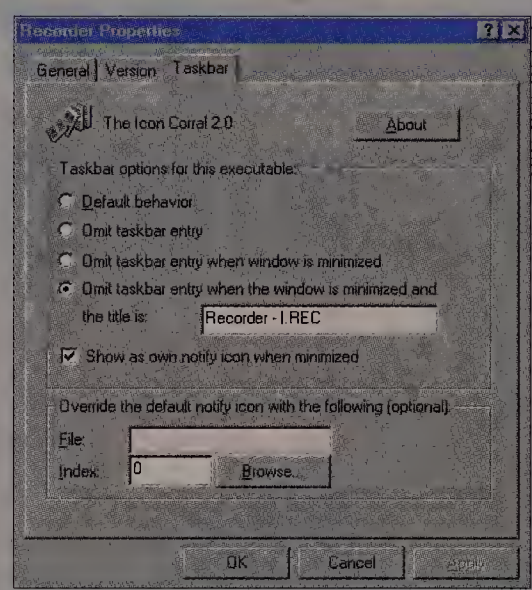
When you have tweaked msdos.sys to your liking, reboot your computer and see Windows start the way you want.

If anything goes wrong, restore msdos.sys from the backup copy and try again if you've got the patience. But if everything's set correctly, you''ll finally be able to open Windows in the way that you desire. ▶

WINDOWS TOOLBOX

Hide Background Applications

ICON CORRAL 2.0 lets you designate which applications should be hidden from the Taskbar and the <Alt>-<Tab> list, placing the application's icon in the "tray" area of the Taskbar instead. Price: $5. Available on PC World Online as iconcor2.zip.



STEP BY STEP

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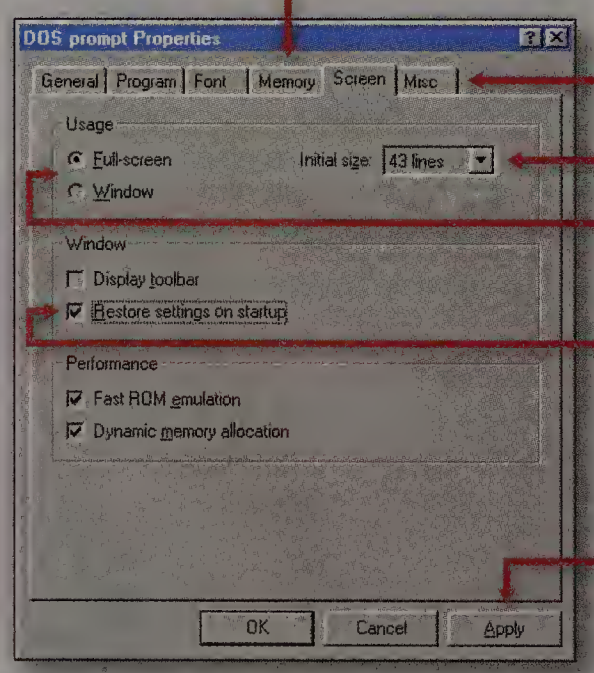

<Shift>-<Ctrl>-<Tab> moves to previous tab (Windows 95 only).

<Ctrl>-<Tab> moves to next tab (Windows 95 only).

<Tab> moves to next option.

<Shift>-<Tab> moves to previous option.

<Alt>-<Down> opens a selected drop-down list.

<character> moves you to the first item starting with that character in a list.

<Right> and **<Left>** or **<Up>** and **<Down>** switch among option buttons or move through a list.

<Space> checks or unchecks a selected box or presses the current button (in dotted outline).

<F1> opens a "What's This?" explanation for the current option (Windows 95 only) or a help window for the entire dialog box.

<Alt>-*<character>* selects the option with that character underlined.

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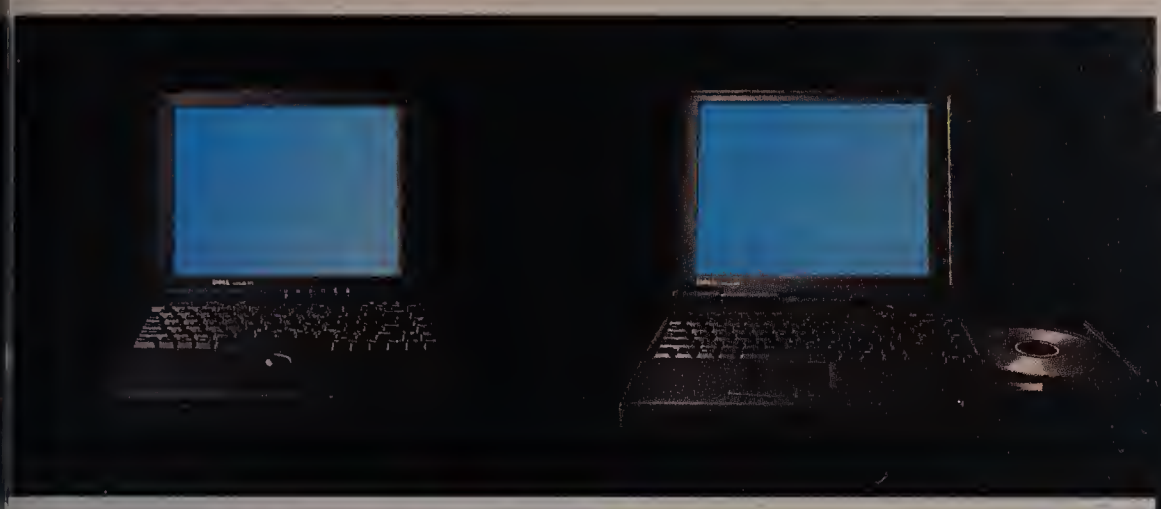

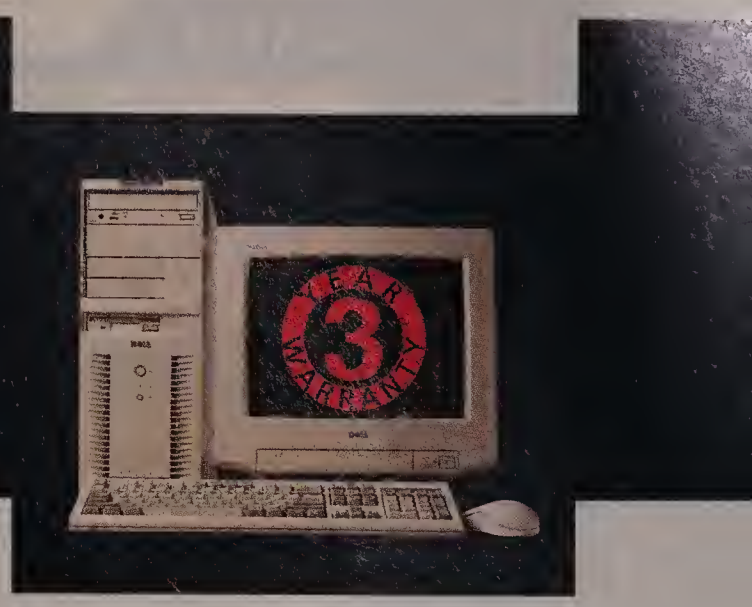

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Watch Who Uses Your PC, Ax Toolboxes in Norton

WINDOWS 3.X

IF YOU'RE USING WINDOWS 3.*x* on a network, you may share one or more of your directories with others in your workgroup. Ever wonder who among them is using your files? That information is just a few keystrokes away.

In File Manager, select any directory with the shared-directory icon (a hand holding a folder) or any file within a shared resource, and press **<Alt>-<Enter>** to see its properties. Click *Open by* or press **<Alt>-O**. The Network Properties dialog box (see **FIGURE 2**) shows the share name of the resource (the name under 'On Share'), which files are open, who opened them, and each user's access level (for example, 'Modify'). You can also see, under 'Open Count,' how many times a file has been opened in the current Windows session.

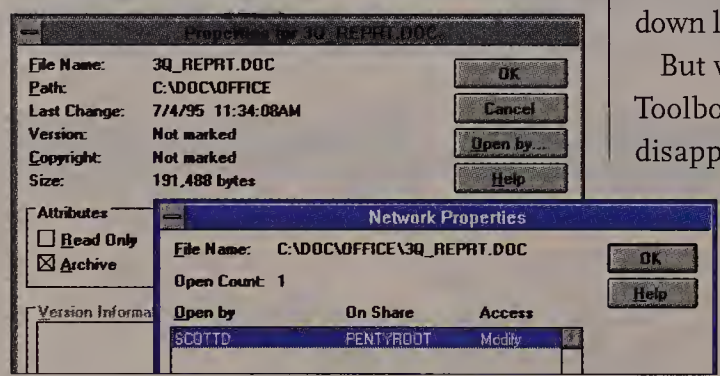

FIGURE 2: WHO'S USING YOUR FILES? Take a peek with the Network Properties box in the Windows 3.1 File Manager.

If you don't want your cohorts using one of these files, select it and click *Close Files*. However, you should use this drastic measure only as a last resort, as it could cause the current user to lose information that has not yet been saved.

UNBUTTONING NORTON'S QUICK ACCESS GROUPS

THE NORTON DESKTOP for Windows 3.*x* has a nifty space-saving feature that lets you turn your Quick Access groups (the equivalent of Program Manager groups) into toolboxes. Application icons will then appear as buttons without the usual (and often redundant) text underneath.

To implement this feature, just double-

FIGURE 3: TIRED OF TOOLBOXES? Change Norton Desktop Quick Access groups with a command that's hidden on the Control menu.

click the icon of the group you want to open and choose *Options•View Group As*. Select *Toolbox* from the resulting drop-down list, and click *OK*.

But what if you change your mind? In Toolbox view, the menu for your group disappears, leaving you to wonder how you can ever get it back.

In Toolbox view, the View Group As command is on the control menu. Just click the control menu box, choose *View Group As*, and change to a less crowded view of your icons (see **FIGURE 3**).

To make all groups appear in the same view (List, Icon, or Toolbox), check *Change All Groups* in the View Group As dialog box; then click *OK*.

Next month: Windows NT tips.

Find files from this article and additional tips at http://www.pcworld.com/windows.html. Contributing Editor Scott Dunn is a principal author of the PC Bible, 2nd Edition *(Peachpit Press, 1995, 800/283-9444).* Windows *welcomes your tips and questions and pays $50 for published items. See page 12 for contact information.* ■

Clean Up After Deleted Apps

I uninstalled CorelDraw in Windows 3.x, but in my word processor I still see 'CorelDRAW! Graphic' on the list of possible objects to insert. How do I remove it?

Terry Chow, Internet

If you merely delete the directory in which you installed an application, you've only partly removed that software from your system. Chances are, files still lurk in Windows' system directories. The only foolproof method of ridding your system of an app is to contact the manufacturer for a complete list of files to remove (and who has time for that?). Otherwise, you must guess which files belong to the application—and should save backup copies of the files you remove in case you guess wrong.

In your case, you need to remove Object Linking and Embedding information, which is often stored in two places, the infamous win.ini file and the registration database.

Here's the remedy. Make a backup copy of the reg.dat and win.ini files in your Windows directory. (Use these backups to restore the files if problems crop up.) Next, start the Registration Info Editor: Choose *File•Run* in Program Manager or File Manager, type **regedit**, and click *OK*. The window displays a list of file types; you should be able to spot the same words that you see in your word processor's Insert Object dialog box (in your case, 'CorelDRAW! Graphic').

Select the file type and choose *Edit•Delete File Type*, or just press **<Delete>** and click *Yes* to confirm the deletion.

That should fix up your word processor; you may need to restart it to see the change. But other information is probably still lurking in win.ini. To open win.ini in a text editor, choose *File•Run* in Program Manager or File Manager, type **win.ini**, and click *OK*. Search for the [embedding] heading and find a line that refers to your application (in CorelDraw's case, the line begins with CDraw=). You can delete the line or, if you're afraid you might need it again, just put a semicolon at the beginning of the line to disable it.

That takes care of OLE, but while you're in win.ini, it's a good idea to look in [extensions] or other areas for additional references to your defunct software. Try searching for the program's executable file name or old file extension and disable or delete those lines as well.

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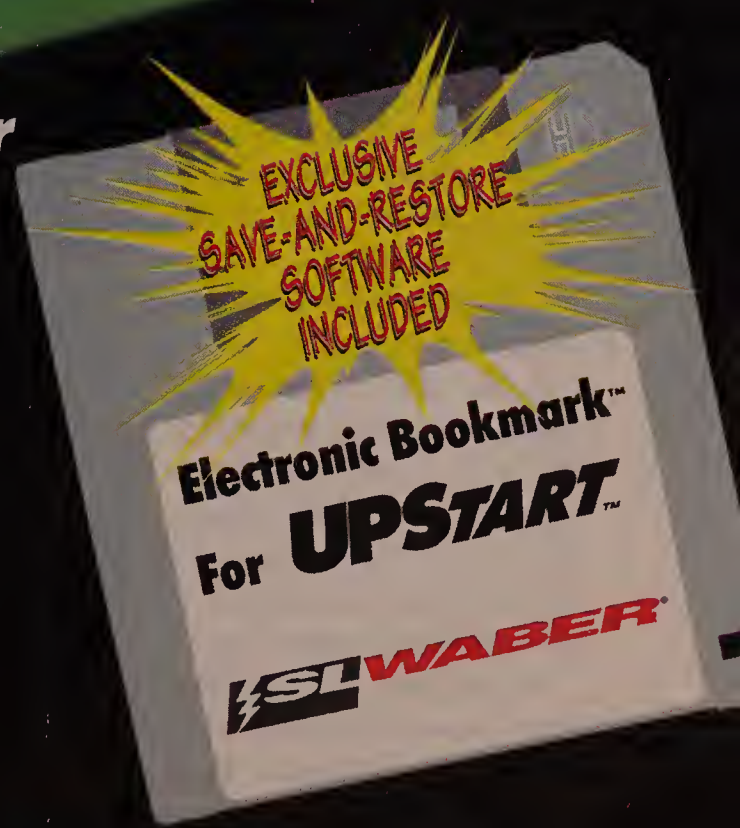

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Save Web Pages, Open Multiple Documents

WORD PROCESSING

BY GEORGE CAMPBELL

WEB PAGES ARE simply ASCII text files with embedded HTML codes. When you want to send the text of a Web page as an e-mail message or use it for some offline purpose, you need to save the file to disk, then strip out all of its HTML codes. You can remove the codes using any of today's word processors, but each program requires a different technique.

FIGURE 1 illustrates how to save a Web page in Netscape Navigator, then how to strip its HTML codes in Word, WordPerfect, and Word Pro. (See "Saving Web Page Info to Disk," in February's *Online* for instructions on saving an HTML document to disk.)

In Word 6.0 for Windows and Word 7.0 for Windows 95, you must use the Pattern Matching feature in the Replace dialog box to replace the codes, but the process is far from intuitive. Here's how to remove the codes in both versions of Word:

1. Select *File•Open*, select *All Files* in the 'Files of type' drop-down list, and open the HTML document you want to strip.
2. Select *Edit•Replace*. In the Replace dialog box, type **\<*\>** in the Find What box, check the *Use Pattern Matching* box, and click *Replace All*. After all the codes are removed, you may have to delete a few excess blank lines.

In WordPerfect 6.1 for Windows, you can't automatically strip out all HTML codes; WordPerfect just can't handle punctuation in a search. But you can get rid of most of the codes, leaving just a few to remove manually:

1. Select *File•Open*, choose *All Files (*.*)* in the *List Files of Type* drop-down list, and open the HTML document.
2. When WordPerfect prompts you to select a file type, choose *ASCII (DOS) Text* in the *Convert File Format From* drop-down list, then click *OK*.
3. Select *Edit•Find and Replace*. Type **<** in the Find box, then select *Match•Codes*.
4. In the Codes dialog box, choose ** (Many Char)* from the Find Codes list, then click *Insert* and *Close*.
5. Type **>**, and then click *Replace All*. Confirm that the 'Replace With' line says '<Nothing>', then click *Close*.

This will remove most of the HTML codes from the document. You'll have to delete any remaining codes or blank lines from the file manually. When you're done, save the document with a new file name, choosing *ASCII (DOS) Text (*.*)* in the Save File as Type list.

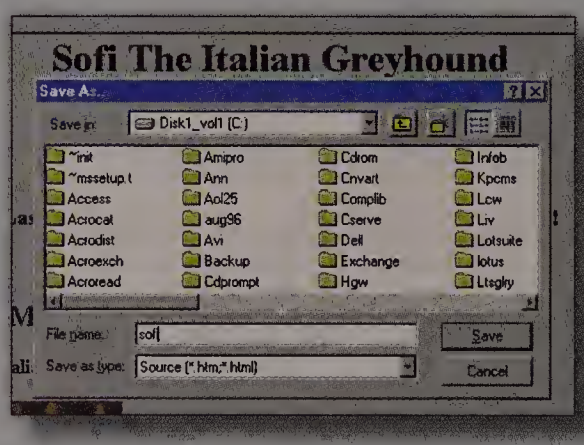
If you use Word Pro you're in luck: Word Pro can open and edit an HTML file directly. The text of the file looks the same in Word Pro as it does on the Web—formatting and all. As a result, you just have to save the document in ASCII format to remove the HTML codes from the file.

1. Select *File•Open*, select *HTML (*HTM)* from the *Files of type* drop-down list, and open the HTML file.
2. Once the file has finished loading, select *File•Save As*, enter a new name, and select the *Text-ASCII (DOS) (*.*)* file type. The resulting file will be clean as a whistle, with no HTML codes at all. ▶

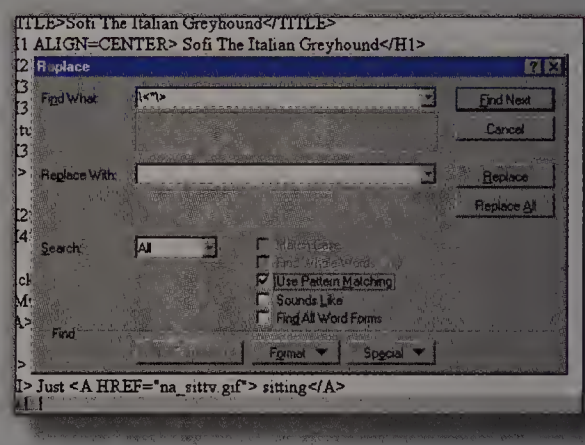
STEP BY STEP

Strip HTML Coding From a Page on the World Wide Web

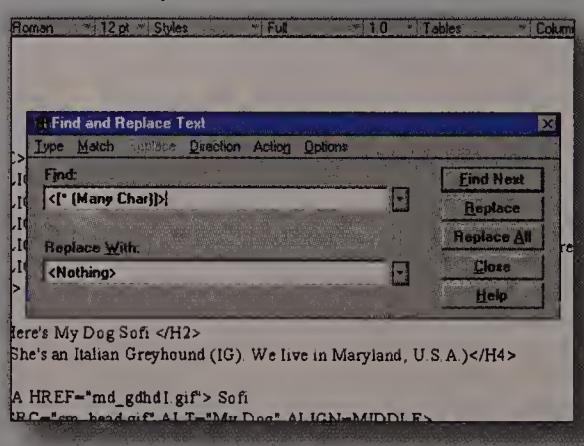
In your Web browser, select *File•Save As* and select HTML as the Save As type.



In Word, use Pattern Matching to replace HTML codes with blanks.



In WordPerfect, you can use Find and Replace to get rid of most codes, but you'll need to remove some manually.



In Word Pro, open the file as an HTML file type, then simply save it as an ASCII file. The HTML codes are stripped from the file automatically.

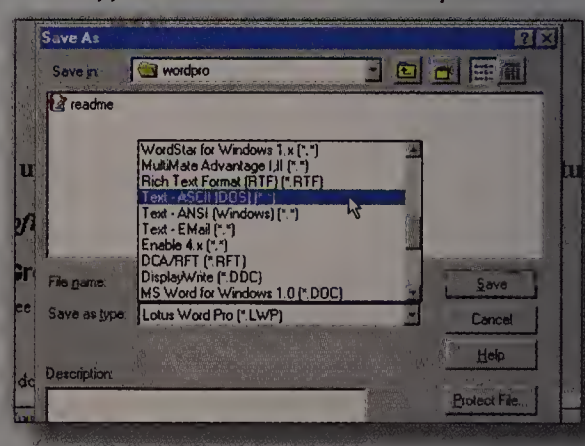
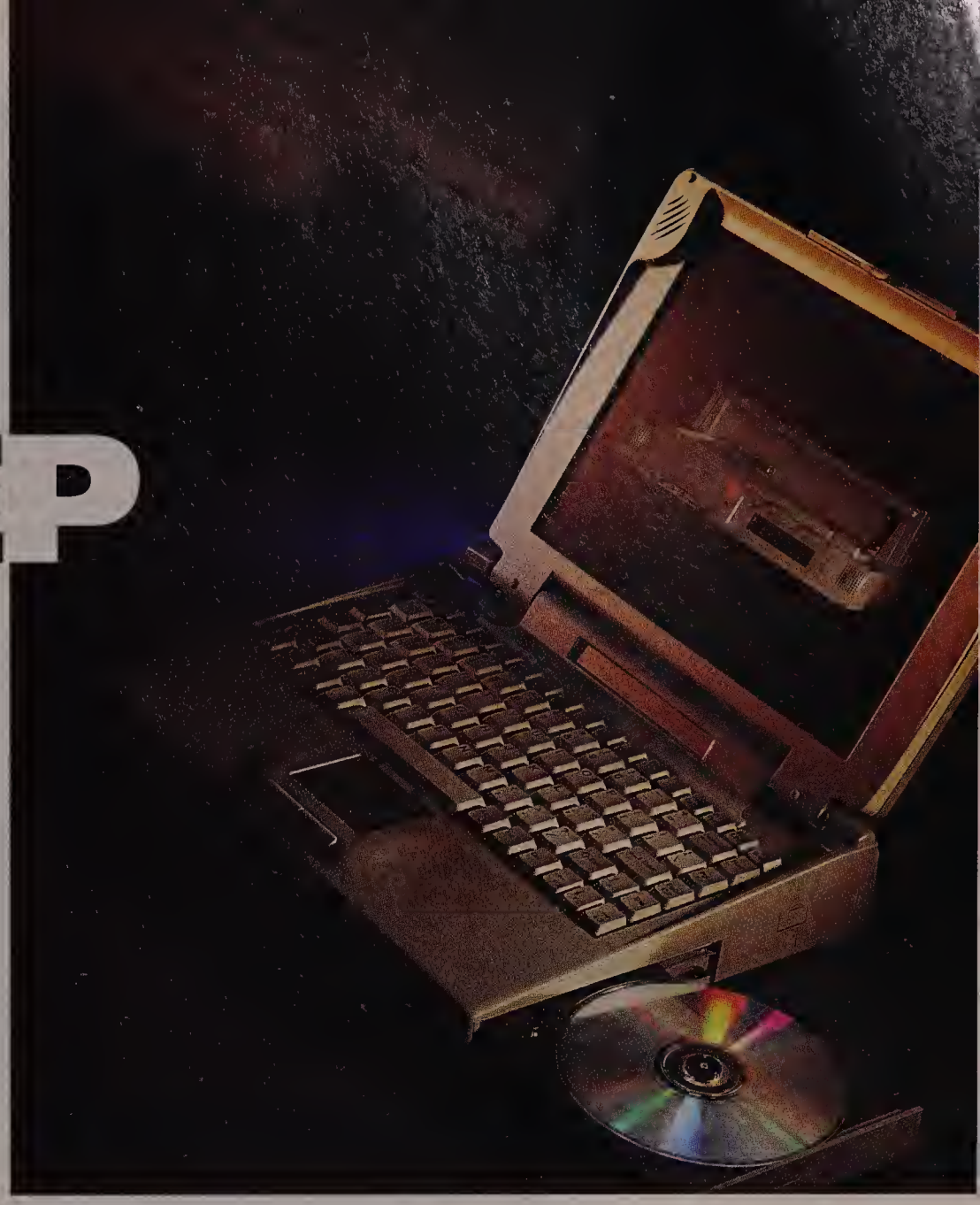


FIGURE 1: WANT TO USE WEB PAGE TEXT FOR OFFLINE PURPOSES? Word, WordPerfect, and Word Pro can strip any Web page of all its HTML codes.

KEEP IN STEP



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OPEN MULTIPLE DOCUMENTS IN ONE PASS

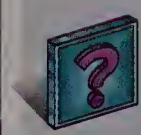
IT'S OFTEN HANDY to open multiple documents in a single operation. Fortunately, in all the current word processors, this is a snap. After selecting *File•Open*, hold down **<Ctrl>** as you click each file you want to open. Then click *OK* or *Open* to open all the documents simultaneously, each in its own window.

CHANGE WORD'S DEFAULT FONT AND TYPE SIZE

MANY WORD USERS OVERLOOK an easy way to change the default font and type size for their documents. While you could make these changes in the normal.dot template, it's usually quicker to open a new document, select *Format•Font*, choose a font and type size in the Font dialog box, then click *Default*. Click *Yes* when asked to confirm the change.

Contributing Editor George Campbell is a contributor to The PC Bible *(Peachpit Press, 1995, 510/548-4393).*

Show All File Types by Default in Word's File Open Dialog Box



IN WORD FOR WINDOWS I often open files that have a different extension than the .doc default. While it's not a lot of work to drop down the file types list to choose All Files (*.*), it's annoying to have to do it almost every time I start Word. I haven't been able to find a way to change this default. Can you help?

Arden Wilson, Vancouver, British Columbia, Canada

YOU CAN ALTER this dialog box, but you'll have to create a WordBasic macro to do it. Here's how in both Word 6.0 and 7.0:

1. Start Word, then select *Tools•Macro*.
2. Type **FileOpen** in the Macro Name text box, then click *Create*.
3. You'll see a few lines of macro code in the editing window. Select and delete all the existing code.
4. Type the macro shown in **FIGURE 2** *exactly* as it appears. Don't forget the quotation marks in the fifth line.
5. Select *File•Save All* and click *Yes* when asked if you want to save the changes.
6. Close the macro window.

The next time you use the File Open command, Word will show you all files, rather than just the standard .doc files.

If you made a typing mistake in your macro codes that causes the File Open command not to work, or if you later decide that you want to go back to the original defaults, just select *Tools•Macro*, choose the *FileOpen* macro you created, then click *Delete*, *Yes*, and *Close*. The next time you load Word, the File•Open dialog box will return to its normal operation.

FileOpen

```
Sub Main
Dim dlg As FileOpen
GetCurValues dlg
dlg.AddToMru = 1
dlg.Name = "*.*"
If Dialog(dlg) Then FileOpen dlg
End Sub
```

FIGURE 2: DISPLAY ALL FILE TYPES in Word's File Open dialog with this macro.

Calculating Dates, Displaying Minimums

SPREADSHEETS

BY RICHARD SCOVILLE

LET ME START off with a big "thank you" this month to all you readers. Your constant, gentle bombardment of questions, suggestions, and tips has taught me an enormous amount about spreadsheets and is the source of the information I pass along every month.

Here's a jewel submitted by Shane Devenshire of Walnut Creek, California, easily the most prolific of all *PC World* spreadsheet tipsters:

Regular spreadsheet date serial numbers are integers that represent the dates between January 1, 1900 (day 1) and December 31, 2099 (day 73,050). September 1, 1996, then, is day 35,309. Many businesses, however, need to know a date's number *within* a year: While January 1 is day 1, September 1 is either day 244 or day 245, depending upon whether it's a leap year, and so on.

This Excel formula converts a date serial number in cell A1 into the day of the year: **=int(mod(A1-1,365.25)+1)**. The mod() function calculates the remainder (modulus) when one number is divided by another, so dividing a date value by 365.25 gives the number of days since the beginning of the current year. (Subtracting one from the year value and adding it back to the modulus prevents the last day of the year from appearing as zero.)

If you're using Quattro Pro or 1-2-3, enter the following formula: **@int(@mod(A1-1,365.25)+1)**. If you're working in 1-2-3 release 5, you can enter this special calendar function to return the number of the day within the year: **@dateinfo(A1,12)**.

A MINIMALIST APPROACH TO MAXIMUMS

READERS OFTEN COME up with better solutions than I do. In March I answered a question from a reader who wanted to report employees' training credits up to a maximum of 50 credits a year. I gave a rather complicated solution that involved an @if function, illustrated in the figure below. (See "Creating If-Then Formulas," *Spreadsheets*, March.)

Abderrahim Bouazza of Rabat, Morocco suggested a much simpler approach: If the employees' actual credits are in cell A2, the formula **@min(A2,50)** yields the credits up to a limit of 50. ▶

C2 (@IF(A2>B2,B2,A2))

	A	B	C
1	Training Points	Maximum Points Allowed	Total
2	65	50	50
3	35	50	35
4	46	50	46

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Recording Sheet Names in Excel Worksheets

I'M USING EXCEL 5.0, and I'd like to display the name of the current sheet (the name that appears on the sheet tab at the bottom of the screen) in a cell in the worksheet. Got any ideas?

Michael Poirier, America Online

LOTS. I'VE BEEN looking for a good excuse to show how to build custom Excel functions, and since there's no built-in Excel information function that returns the current sheet name into a designated cell, I guess this is my chance. You can store your new function in a personal macro workbook so that it's available for any workbook, and you can include it in the Function Wizard with the other information functions. Just follow the steps outlined below and illustrated in **FIGURE 3**.

1. If you have a personal macro workbook, unhide it so that you can add your new function to it: Select *Window•Unhide*, select the file *personal*, and click *OK*.

If you don't have a personal macro workbook (the Unhide option will be grayed out), start in a blank worksheet; you'll create a personal macro workbook with the following steps.

2. Create your custom function by selecting *Insert•Macro•Module*, and entering the macro shown in the figure.

3. Add your new custom function to Excel's list of regular functions: Select *Tools•Macro*, select *SheetName*, and click *Options*. In the Macro Options dialog box, enter the following in the Description field: **Returns name of the worksheet where reference is located. Otherwise, returns active sheet.** In the Function Category field, select *Information* from the drop-down list. The Function Category determines where your macro will show up in the Function Wizard, and the Description is the text that will appear when you select the function in the wizard's list. In the Status Bar Text field, enter **Name of active sheet**, then click *OK* and *Close*.

4. Now, hide and save your personal macro workbook: Select *Window•Hide* to hide the workbook, then exit from Excel, whereupon Excel will prompt you to save the hidden workbook. If you started with your personal.xls, just confirm the save. If you started with a blank sheet, navigate to your Excel\Xlstart directory and save the file as **personal**. Because files in this directory are opened automatically whenever you start Excel, your function will be available for use in all future workbooks.

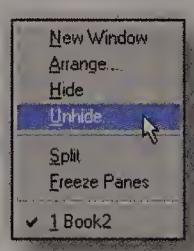
5. When you're ready to use your new function, select *Insert•Function*. In step 1 of the Function Wizard, select *Information* in the Function Category list, select *personal.xls!SheetName* in the Function Name list, and click *Next*. In step 2, enter a cell address in the 'reference' field and click *Finish*. Excel returns the name of the current sheet in the active cell. To get the name of a sheet other than the current one, in step 2 enter ***sheetx*!a1**, where *sheetx* is the name of the other sheet.

To bypass the Function Wizard, just enter the formula **=personal.xls!sheetname(A1)** in a cell in the worksheet where you want the sheet name to appear. Excel will return the name of the current sheet. To return the name of another sheet in the current workbook, enter the formula **=personal.xls!sheetname(*sheetx*!A1)**, where *sheetx* is the name of the other sheet. ▶

Contributing Editor Richard Scoville is a software training consultant in Chapel Hill, North Carolina.

STEP BY STEP

Build a Custom Excel Function and Add It to the Function Wizard

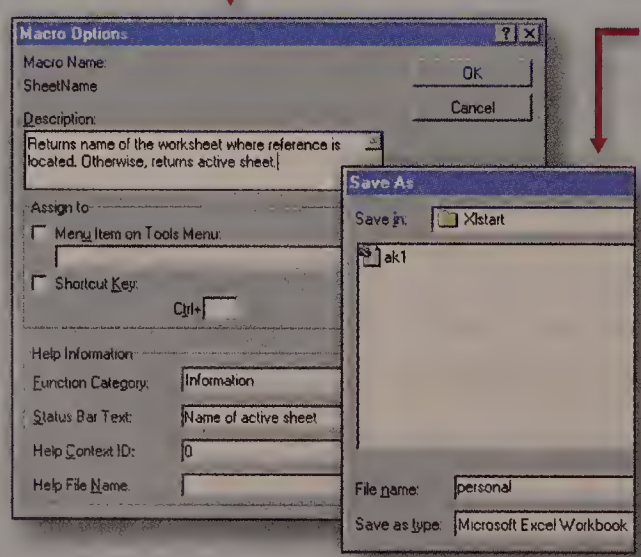


❶ Unhide your personal macro workbook, if you have one.

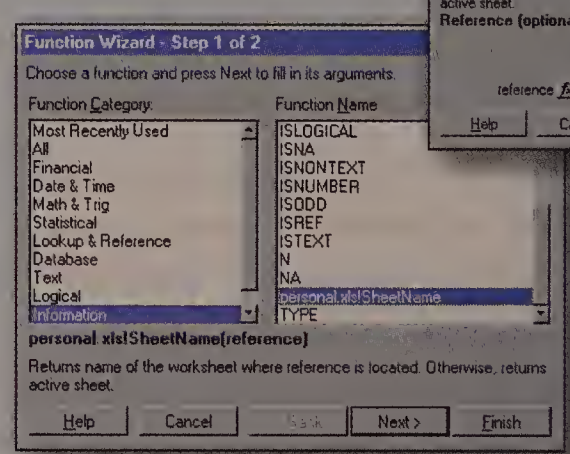
❷ Create the function by entering this macro into your personal macro workbook.

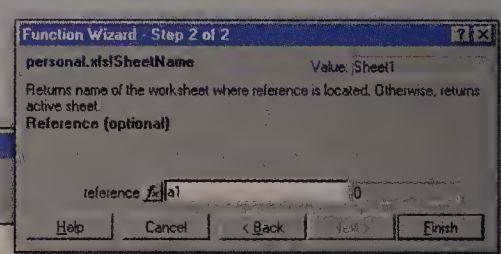
```
'Function puts sheet name into current cell
Function SheetName(Optional reference) As String                    '1)
    Application.Volatile                                            '2)
    If IsMissing(reference) Then                                    '3)
        SheetName = ActiveSheet.Name                                '4)
    Else
        SheetName = Range(reference.Address(, , , True)).Worksheet.Name '5)
    End If
End Function
```

❸ Add your custom function to Excel's list of regular functions.



❹ Hide and save your personal macro workbook.





❺ To use your new function, select *Insert•Function*, select the category and name of the function, click *Next*, enter a cell address, and click *Finish*.

FIGURE 3: CREATE THIS FUNCTION TO RETURN THE CURRENT SHEET NAME, and add it to Excel's other information functions.

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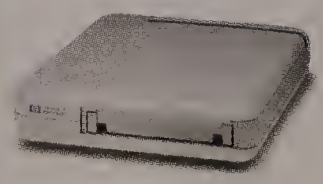

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Search an Access Database for Two Words at Once

DATABASES

BY CELESTE ROBINSON

WHEN YOU WANT to search an Access database for all records that contain a specific word—say, *pepper*—the Edit•Find command is fine. But if you want records that contain both *pepper* and *fiery*, you need a query. Here we create one that lets us search for two words. We'll attach the query to a search form, where you enter the words, and a display form to show the records. The steps are shown in **FIGURE 4**.

1. To create the query, open the sample Northwind database, click the *Queries* tab, then click *New*. Leave *Design View* highlighted and click *OK*. In the Show Table dialog box, double-click *Products* and click *Close*. In the Query window, click and drag the * under Products in the top half of the window to the Field row of the first column in the query grid. Click and drag the *ProductName* field to the second column of the grid and uncheck its box in the Show row. In the Criteria row for ProductName, type **Like "*" & [Forms]![Find Products]![Word 1] & "*" And Like "*" & [Forms]![Find Products]![Word 2] & "*"**. Save the query as **Find Products**.

2. Now we create the display form. You can copy an existing form or design a new one. Here, we'll revise the Product List form. In the Database window, click the *Forms* tab, highlight *Product List*, and click *Design*. Right-click the title bar of the form and click *Properties*. Click the *Data* tab in the resulting dialog box to show the *Record Source* property. From the Record Source menu, select the *Find Products* query we created earlier. Close the form and save your changes.

3. Now you're ready to create the search form. In the Database window, click the *Forms* tab, then click *New*. Leave *Design View* highlighted and click *OK*.

Next, click the *Text Box* tool in the Toolbox and use it to add a text object to the form. Right-click the new object, choose *Properties*, click the *Other* tab, and change the Name property to **Word 1**. Right-click the label box to the left of the object, choose *Properties*, click *All*, and change the Caption property to **First word**. Click the text box again and choose *Edit•Duplicate*. Change the Name property to **Word 2** and the Caption property to **Second word**.

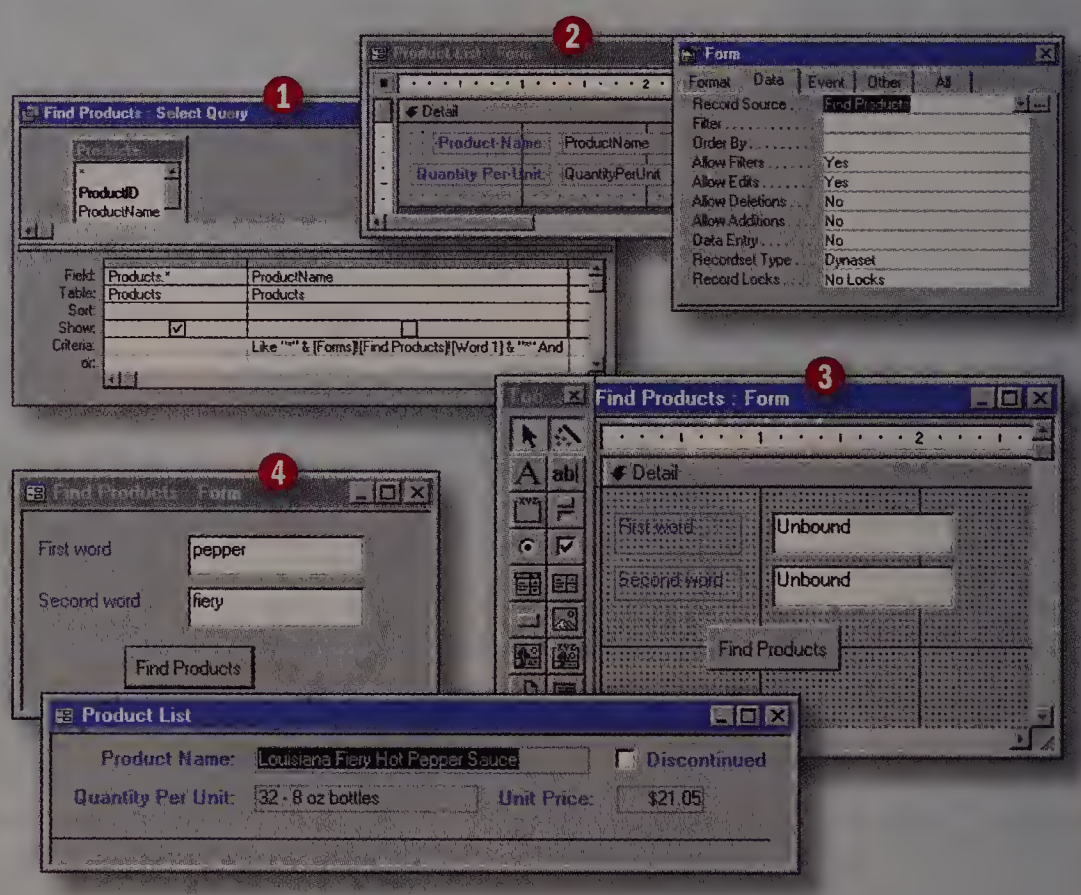
In the Toolbox, click *Command*, then draw a button under the text objects. In the first step of the Command Button Wizard, click *Form Operations* in the Categories list, and click *Open Form* in the Actions list. Click *Next*, select *Product List* for the form you want the button to open, and click *Next*. For the third step, click *Next*. In the fourth step, click *Text*, enter **Find Products** for the button's label, and click *Next*. In the final step, enter **Find Products** for the button's name, and click *Finish*. Save the form as **Find Products**.

4. To use your new search form, click the *Forms* tab in the Database window, select *Find Products*, and click *Open*. Type the words you want to search for and click *Find Products*. The matching records will appear in the form you created in step 2. ■

Contributing Editor Celeste Robinson is coauthor of Mastering Paradox 7 for Windows 95 *(Sybex, 1996, 800/227-2346).* Application Tips *welcomes your questions and tips and pays $50 for published items. See page 12 for contact information.*

STEP BY STEP

Perform Multiword Searches by Creating an Access Query



❶ Create the Find Products query.

❷ Create the Product List display form and attach the Find Products query.

❸ Create the Find Products search form and attach the Find Products query.

❹ To search for records, type the words you want to search for and click *Find Products*. The matching records are displayed in the Product List form designed in Step 2.

FIGURE 4: SEARCH AN ACCESS DATABASE FOR OCCURRENCES OF TWO WORDS by creating a query and then attaching it to a search form and a display form.

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Images You Can't Copy, Errors You Can Handle

YOU'D LIKE TO POST LOGOS for NFL teams or NASA missions on your Web pages. Or you'd like to add digitized photos from a newspaper's sports pages or plays captured from TV with your video card. Your friends, however, tell you that you can't. Are they right?

I hate to say it, but people like you are becoming a nuisance to corporate America—although not to the lawyers who are doing brisk business stamping out unauthorized trademarked and copyrighted material popping up on the Web.

The National Football League Properties has been cracking down on overzealous football fans who put NFL intellectual property on their Web pages. Such items include trademarks and logos of the NFL and its teams, plus copyrighted photos, videos, and even pictures of uniforms and helmets.

"We're excited that our fans are putting the NFL on the Internet, but the NFL must still protect its trademarks," says spokesperson Brian McCarthy.

Why can't the NFL let sports fans post its shield and other folderol on their pages? For one thing, the NFL doesn't want football fans to think these pages are officially sanctioned. Also, if the NFL doesn't actively protect its trademarks and copyrights, they fall into the public domain. Then anyone is free to print NFL logos on anything—T-shirts, footballs, toilet paper—and the NFL won't be able to collect those lucrative licensing fees.

The NFL Properties' law firm has been sending letters to Web page owners asking them to remove NFL trademarks and copyrighted material from their pages. So far, they say, most people have complied. You can find the NFL's cyberhome at Team NFL (http://www.nflhome.com/).

What can you put on your Web page without invoking a legal firestorm? First, if you want to post something on your page that you think may be copyrighted or trademarked, always ask permission (see the chart below). If you're not sure, ask anyway. Some companies and organizations have put images on their Web sites that the public is free to download. But there are often rules for posting them.

For instance, NASA has an enormous library of photos online (http://www.hq.nasa.gov/office/pao/Library/photo.html). While anyone can download images of a shuttle and post them on a Web page, NASA asks that page owners refrain from posting photos of astronauts, for that might constitute a violation of the astronauts' privacy. NASA also asks that Web page owners refrain from posting any NASA emblem or logo on their pages.

Of course, you can always post those pictures you draw in your paint program.

Webmaster, Beware! Putting Copyrighted Material on Your Page Is Illegal

What You Need Permission For...	...and Why
Logos of companies, sports teams, products, and charities; comic strip characters; faces or images of celebrities, which can include items like the starship Enterprise and the Batmobile.	They're trademarked. Someone owns the image and the right to determine how others use it.
Art and photos from books, magazines, company brochures, greeting cards, newspapers, comic strips, CD-ROMs, and other Web pages, even if you alter them.	They're copyrighted, even if there's no copyright symbol. Someone owns the image as well as the right to determine how others use it.
Single frames, animation sequences, and sound bites from movies, TV, radio, audio CDs, and rented or purchased videos, even if you edit or alter them.	They're copyrighted. Even if, as one sports fan argued, "the pictures fly through the air, so they have to be free," they're still copyrighted.
Text from books, magazines, newspapers, CD-ROMs, databases, Web pages, and other people's e-mail.	They're copyrighted, even if there's no symbol. "Fair use" provisions of copyright law allow you to quote 50 words or less for reviews, but it's still smart to obtain permission from the copyright holder before using the material.

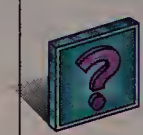
DECODE CRYPTIC INTERNET ERROR MESSAGES

FED UP WITH UNINTELLIGIBLE error messages like 'DNS Lookup Failure'? Head to one of the major Web search engines like Excite (http://www.excite.com/). Type the error message in the 'What are you looking for?' box, and select *the Web* and *by concept* in the Search boxes. Chances are good that your search will turn up a Web site that offers an explanation of the error.

DISARM HACKERS

ALWAYS RUN THE LATEST version of any Internet software, be it a browser, e-mail, or FTP server. Alert vendors are always updating their products to patch security holes. And hackers rely on users who don't update their software.

PREVENT JAVA SPILLS



I'VE HEARD THAT since Java works by downloading programs to your Web browser, it's intrinsically insecure because a computer virus could be hidden in a downloaded program. Should I disable Java in my browser?

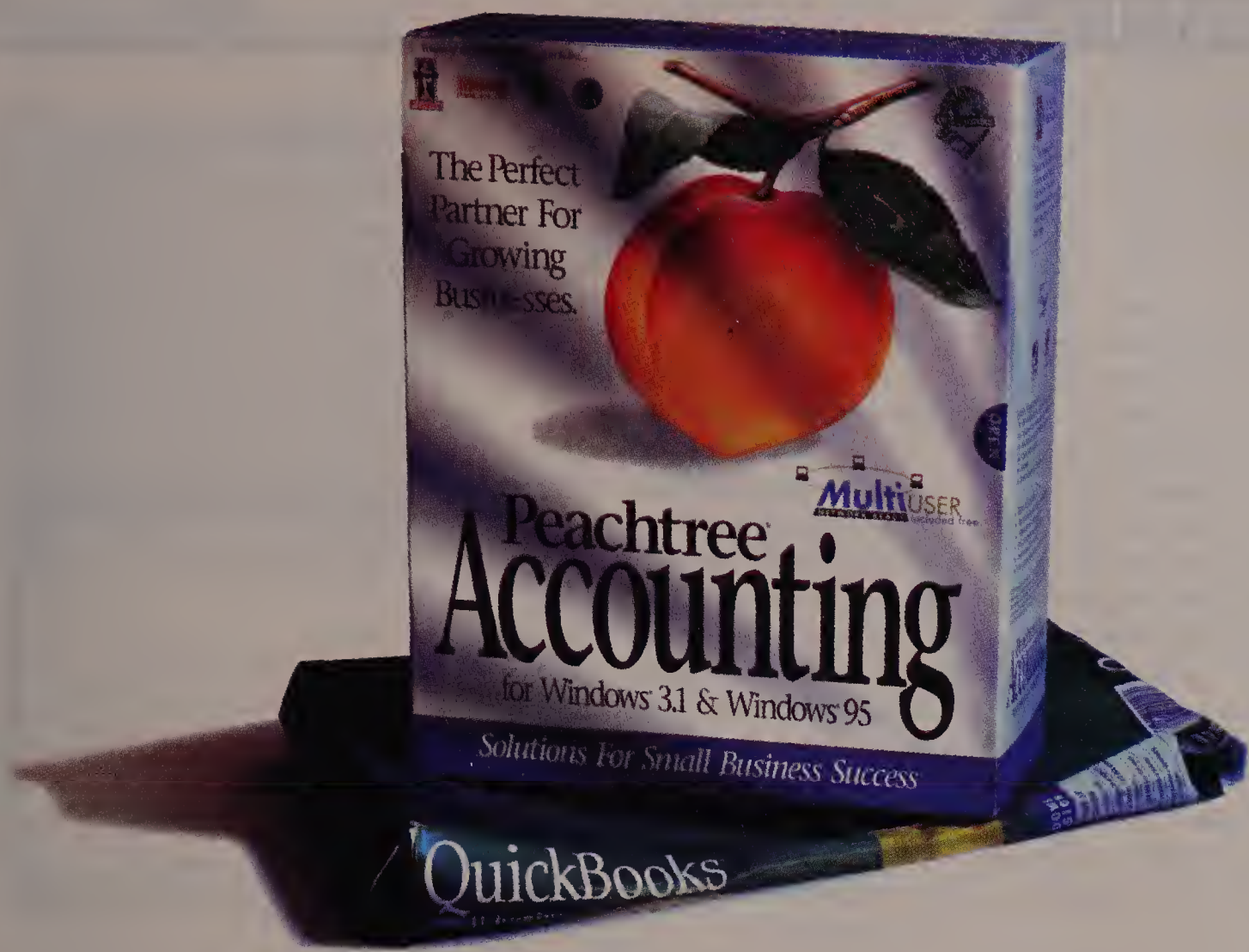
Connie Kerry, Rockford, Illinois

JAVA IS ONE of the hottest things to happen to the Internet. It's a programming language used by Web developers to add animation and other special effects to their pages. You can even use Java to create full-blown applications such as spreadsheets. But in order to see these effects or access Java-built programs, you have to employ a Java applet that runs on your computer.

And yes, that applet could be harboring a virus.

That possibility is a very big concern to the programming language's developer, Java Soft, a business unit of Sun ▶

ICONS: JEFFREY PELO



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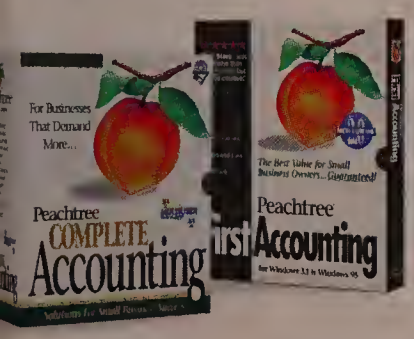

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Microsystems. "We worry a lot about security," acknowledges Benjamin Renaud, a staff engineer for Java Soft. "But Java is probably more secure than most things on the Internet."

Built into Java is a "security manager" that prevents Java applets from performing any of a number of illegal acts, such as writing to your computer's hard disk or accessing a network server through a fire wall. That's the same sort of protection that a high-quality antivirus utility would provide on your system. And according to Renaud, the security manager makes Java safer than other browser plug-ins that also work by downloading programs off the Web.

He's probably right. But as one representative of Java Soft said, "There are never any guarantees." Many computer security experts are therefore recommending that Web surfers disable Java in their browsers.

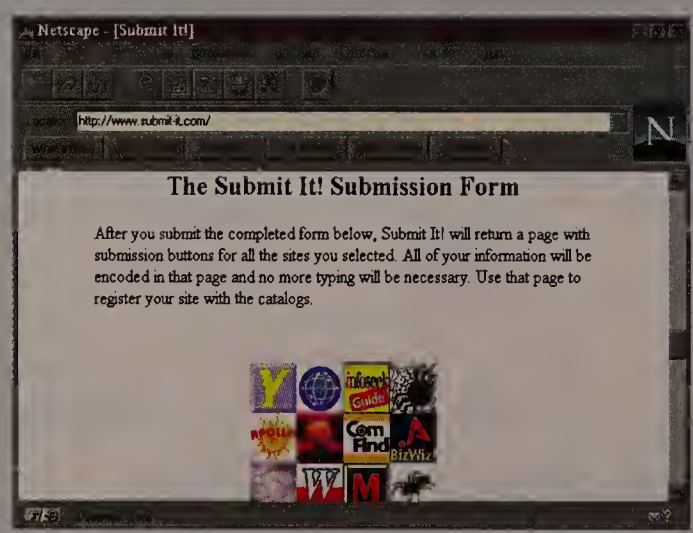
There's another reason to consider disabling Java: Web developers are head over heels in love with it, but often use it only as eye candy rather than delivering what you really want to get from their sites. That can bring your Web access to its knees if you're dialing in.

If you have this problem, you can selectively disable Java support in your browser, depending on how you're getting to the Net, what sites you want to see, and how much time you have to spare.

Get Your Web Page Noticed

Publicize your Web page by heading to Submit It (http://www.submit-it.com/). Fill out a form with details about your page, and Submit It links you directly to each Web searcher, one by one. They prompt you for additional information if any is required. And some give you immediate verification that your URL has been added to their database or has been added to their database of URLs to check.

Similar Web sites include the URL Register (http://www.mps.org/~mcampbel/html/register.url.html) and KeyComm (http://www.nidlink.com/~keycomm/urlsub.html).



READ MAC FILES THAT FRIENDS SEND YOU

A FRIEND WHO works on a Macintosh has been trying to send me word processing, graphics, and sound files in standard formats. Theoretically, I should be able to read them on my PC. But after I download them, all I see is junk on my screen.

Angie Lueders, Framingham, Massachusetts

MAC FILES COME with headers of special file information that must be stripped before the file can be digested by a PC. Here's a tip: If you download a .gif file from the Web that you suspect may be a Mac .gif file, try opening it in your word processor. If the characters 'giffqgif' or 'bozo' appear near the start of the file, it's a Mac .gif.

Lots of free utilities are available online to strip Mac files of their headers. One is mb_strip.exe, available on PC World Online. If you're a member of America Online, download from that service wmac2pc.zip for the Windows version of AOL (select *Goto•Search Software Libraries*), or aomac2pc.zip for the DOS version. These programs strip headers from Mac files transmitted via AOL.

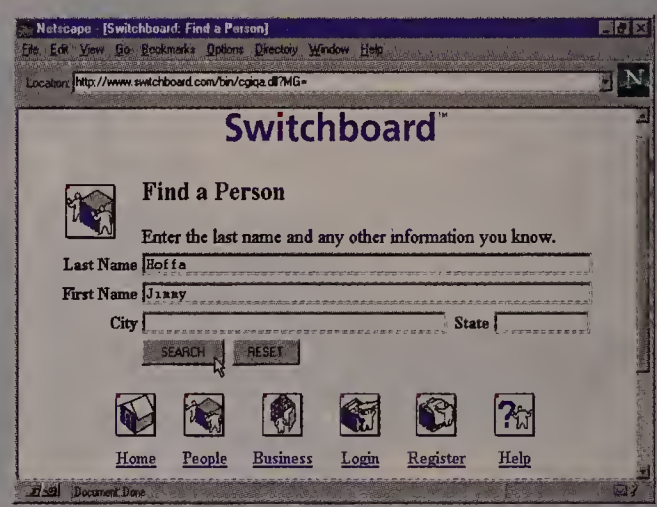
In addition to stripping headers from Mac files, you might also need to decompress the files. The Mac version of AOL uses a utility called StuffIt, the Mac equivalent of PKZip, to compress files. For instance, if you've tried to exchange a file with a Mac user via AOL, you've probably noticed that AOL's software compresses the file in such a way that your Windows or DOS AOL software can't read it. If a Mac file name ends with .sit, then you know it's been "stuffed." To remedy this, download the free StuffIt Expander by Aladdin Systems, the makers of StuffIt. Look for the file sitex10.exe on PC World Online.

Also, if you've received sound files from a Mac user, you'll need to run them through a third utility to convert them to popular PC sound formats. To convert those Mac .snd files to Windows .wav files, download snd2wav.zip. To convert .snd files to Sound Blaster .voc format, download snd2voc.zip. Again, these files are available on PC World Online.

Finally, don't forget to shorten the name of the Mac file. Unless they're running Windows 95, PCs don't tolerate long file names as Macs do. ■

Online White Pages Track Phone Numbers Nationwide

In response to the item "Tracking Down Lost Friends and Family" in April's *Online* column, several readers recommended Switchboard (http://www.switchboard.com/). This handy site lets you look up phone numbers plus street and e-mail addresses for people and businesses around the country.



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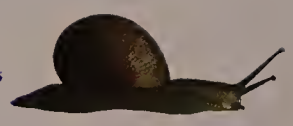

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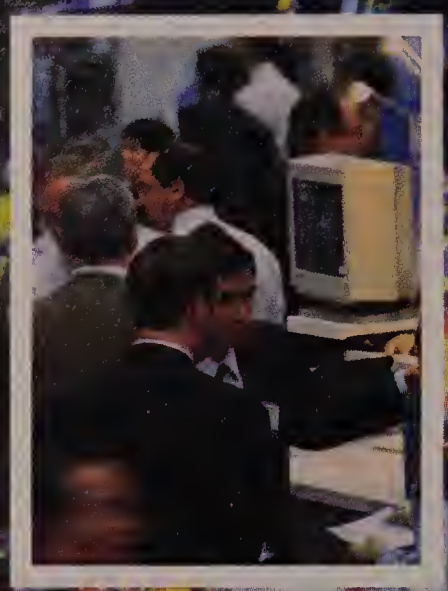

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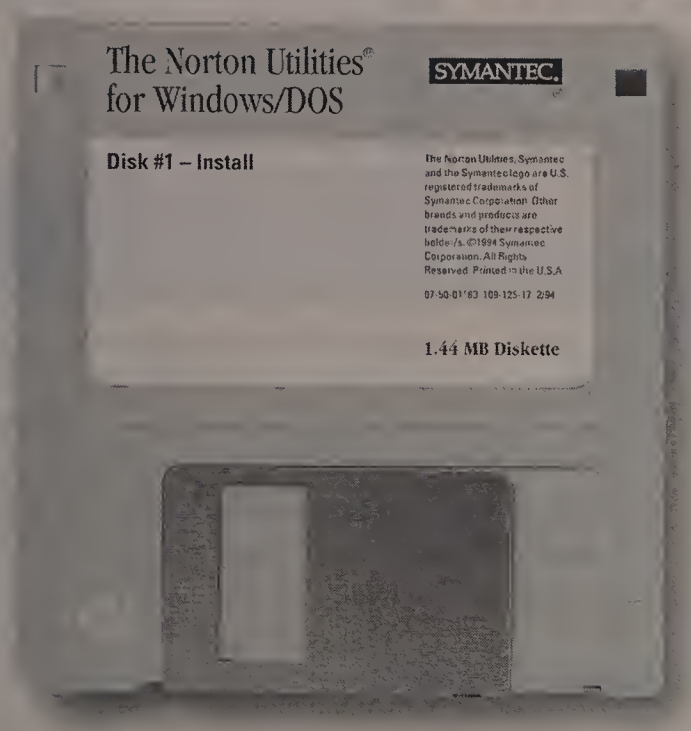

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Fixing What IRQs You

YOU MIGHT THINK that installing an expansion card is easy, especially after hearing all the hype about Windows 95's Plug and Play. Unfortunately, Plug and Play isn't necessarily playing in your neighborhood—mostly because PnP-compatible systems and peripherals are still in the minority, and Plug and Play needs both in order to work.

When you install an expansion card, the most likely problem you'll encounter is a hardware interrupt conflict. Every PC has 16 interrupt request lines, or IRQs—special channels to the CPU used by various devices in your system to get the CPU's attention. Normally when any two devices try to use the same IRQ, either your computer won't boot or the device won't work properly. (There are exceptions: The PCI bus lets more than one device use a single IRQ, and a chain of SCSI devices can use more than one, too.)

So how do you avoid IRQ conflicts? It should take just two steps. First, find out which IRQ is taken by each device in your system. Second, when you install a new device, set it to an IRQ not currently used (by flipping a switch, moving a jumper on the card, or running a utility that comes with the card).

But finding out how your system currently allocates IRQs is not necessarily simple. Microsoft's MSD (which comes with DOS and Windows 3.*x*) and a number of other diagnostic programs claim to give you accurate IRQ information. And many expansion cards come with a disk-based routine that you run before you install the card to determine the available IRQs. Unfortunately, neither method is particularly reliable.

If you're running DOS or Windows 3.*x*, the easiest way to determine which IRQs are being used is to check the common IRQ assignments, shown in **FIGURE 1**. For other devices in your system, you'll have to consult the manual that came with the device. (Some expansion cards help out with a tiny list of jumper settings printed on the front or back).

Windows 95 users have it easier. Even without Plug and Play devices, you can get a reasonably accurate readout of the IRQs in use. Right-click *My Computer,* choose *Properties,* click the *Device Manager* tab, and double-click the *Computer* icon for a complete list, as shown in **FIGURE 2**.

Once you know what's allocated where, how should you assign your new device? Keep in mind the following points:

1. IRQ2 and IRQ9 are actually one IRQ. If you install a device on IRQ2, you can't use IRQ9, and vice versa.
2. Almost all systems allow you to turn off one or more of the COM1, COM2, LPT1, and LPT2 ports using the system setup utility, which frees up the IRQ assigned to that port. By default, all the ports are generally turned on except for LPT2—not many people have a second printer.
3. IRQ5 is the most popular assignment for expansion cards. Sound Blaster cards, for example, grab it by default, although you can change the assignment.
4. This leaves IRQs 9 through 12 as the most likely free IRQs, although some systems use IRQ12 for a PS/2-compatible mouse (which takes the place of a serial mouse, freeing up a COM port).
5. SCSI cards generally give you a choice of IRQs 5, 10, 11, and usually a couple of other assignments.

Is it possible to run out of IRQs? Yes, although it's rare.

You might try to get around this in PCI systems (virtually all Pentium PCs). Every PCI card shares the single IRQ that the system assigns to the PCI bus, typically IRQ11, so you might think that you could free up a couple of IRQs by installing more PCI cards and fewer ISA cards. But the graphics card and the hard disk interface typically are already on the PCI bus. And aside from high-priced PCI SCSI cards, few cards come in PCI flavors.

Not many people run up against the IRQ limit, but avoiding conflicts can be a hassle. Do yourself a favor and keep a written record of every IRQ taken by every expansion device in your system. ■

Eric Knorr is editor of The PC Bible *(Peachpit Press, 1995, 800/283-9444).* Hardware Tips *welcomes your questions and tips and pays $50 for published items.* *See page 12 for contact information.*

Getting the Numbers on Interrupt Request

IRQ	Device
0	System timer
1	Keyboard
2	Programmable interrupt controller
3	Second serial port (COM2)
4	First serial port (COM1)
5	Second printer port (LPT2) or sound card
6	Floppy disk controller
7	First printer port (LPT1)
8	System CMOS/real-time clock
9	Free
10	Free
11	PCI bus (typical)
12	Free (or PS/2-compatible mouse)
13	Math coprocessor
14	Primary IDE hard disk
15	Secondary IDE hard disk (or CD-ROM drive)

FIGURE 1: AVOID INSTALLATION HASSLES by minding your IRQs. When you install an expansion card, it probably can't use the IRQs in red, since they're almost always used by the motherboard. A typical system with a printer, sound card, and CD-ROM drive also uses the IRQs in blue, although these devices can generally be disabled in the CMOS setup or shifted to another IRQ.

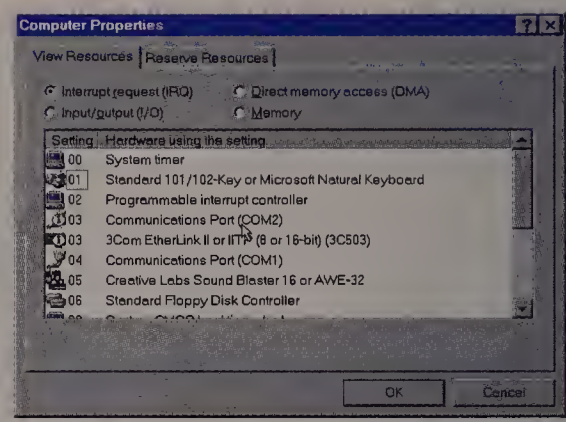

FIGURE 2: WINDOWS 95'S DEVICE MANAGER shows all IRQs in use on your PC.

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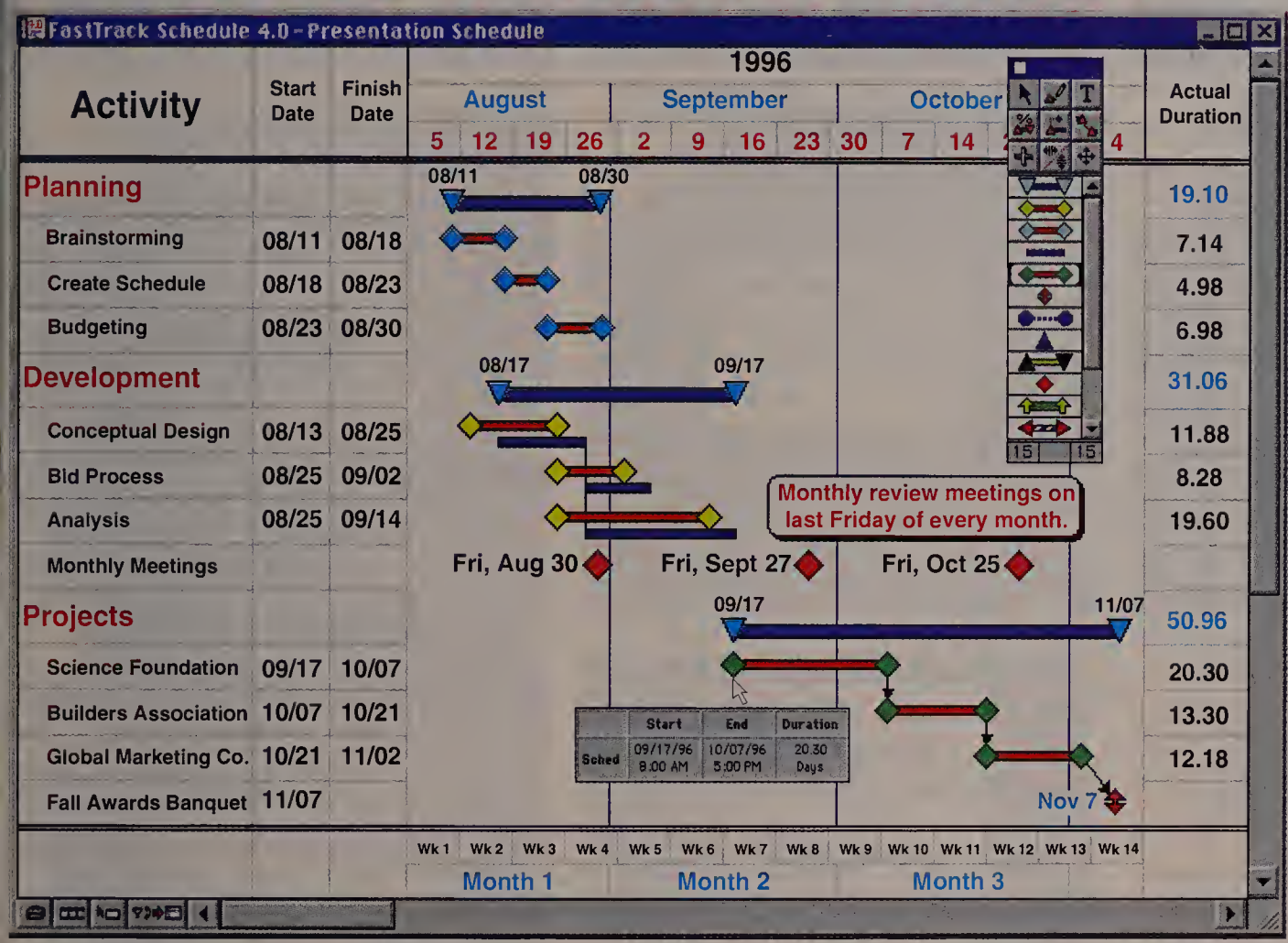

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Launch CD-ROMs Quickly, Swap Your Soundtracks

WINDOWS 95 INTRODUCED important enhancements for multimedia, not the least of which is the ability to play CD-ROMs and audio CDs automatically when you pop them in the CD-ROM drive. This AutoPlay is a godsend if you have kids who like CD-ROM–based games.

If AutoPlay doesn't work, first see if 'Auto insert notification' in the CD-ROM Settings sheet in Win 95's Device Manager is unchecked. But not every CD-ROM plays automatically. It won't if the program lacks a file called autorun.inf, which tells Windows which program to run.

Fortunately, one of Microsoft's nifty-but-unsupported PowerToys utilities brings AutoPlay-like behavior to CD-ROMs that otherwise won't start up automatically. Autoplay Extender, shown in **FIGURE 1**, is a memory-resident program that watches your CD-ROM drive for new discs. When it encounters one that lacks autorun.inf in the root directory, it pops up a window that lists Shortcuts to the CD's programs.

Annoyingly, though, you must create these links, and the utility won't launch a default application automatically.

You can find CD AutoPlay Extender on Microsoft's PowerToys page (http://www.microsoft.com/windows/software/powertoy.htm). Create a folder called AutoPlay on your Windows desktop and download the self-extracting archive file aplay.exe to that folder. Open the AutoPlay folder, double-click the file *aplay.exe*, then right-click *aplayext.inf* and select *Install* from the menu.

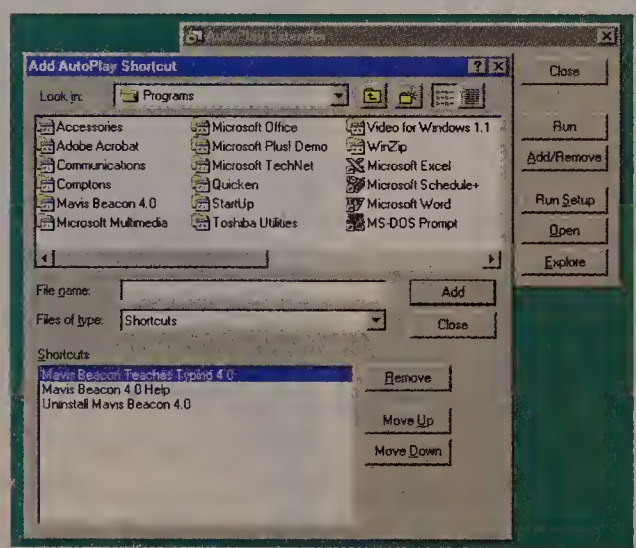


FIGURE 1: LAUNCH YOUR CD-ROM APPLICATIONS semiautomatically with AutoPlay Extender.

You'll probably get an error message telling you to insert an AutoPlay disc. Just click *OK* to clear the error box, then in the next box, browse to the AutoPlay folder and click *OK* twice to complete the installation. After you restart your PC, inserting a non-AutoPlay–enabled CD-ROM will trigger the AutoPlay Extender interface.

Click the *Add/Remove* button to copy one or more Shortcuts to programs on the CD into the AutoPlay Extender dialog box (see Figure 1). Next time you insert the CD, the same box will pop up. To run a program, double-click its Shortcut, or click *Run* or press **<Enter>** to launch the program at the top of the list.

SWAP SOUNDS IN .AVI FILES

GOT AN .AVI VIDEO CLIP with a nice soundtrack you'd like to use elsewhere—as the Windows startup sound, for example? Or found a clip that would be great in a presentation—once you replace the soundtrack with one of your own?

Free- and shareware video editors are nonexistent as far as I know, with one exception: Microsoft's free VidEdit utility, part of the developers' edition of Video for Windows. You may be able to find this software on the Multimedia Jumpstart CD-ROM (although that product is officially discontinued) or in Sirius Publishing's 10 Pak. You might have better luck checking on Microsoft's FTP site for a developer's version of Video for Windows that includes VidEdit (ftp://ftp.microsoft.com/developr/drg/multimedia/jumpstart/vfw11e/odk/winvideo/). Download the directory's contents to a temporary directory, run the setup program, then restart Windows. The program will install and run under Windows 3.1 and Win 95.

To extract the .wav file soundtrack from an .avi clip and save it as a separate file, open the clip in VidEdit, select the beginning and end of the audio section you'd like to copy using the *Mark In* and *Mark Out* buttons (see **FIGURE 2**), choose *File•Extract*, select *Microsoft Waveform* as the file type, enter a path and file name for the new file, then click *OK*.

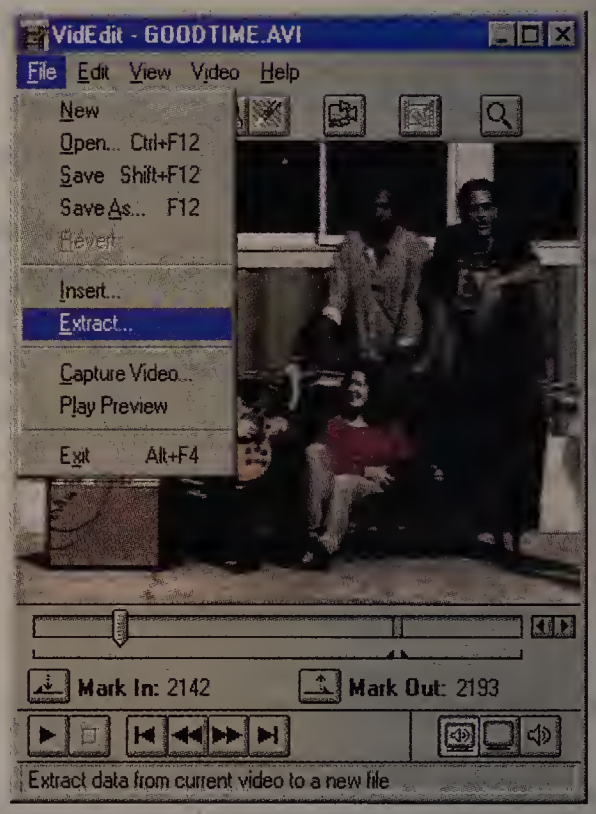
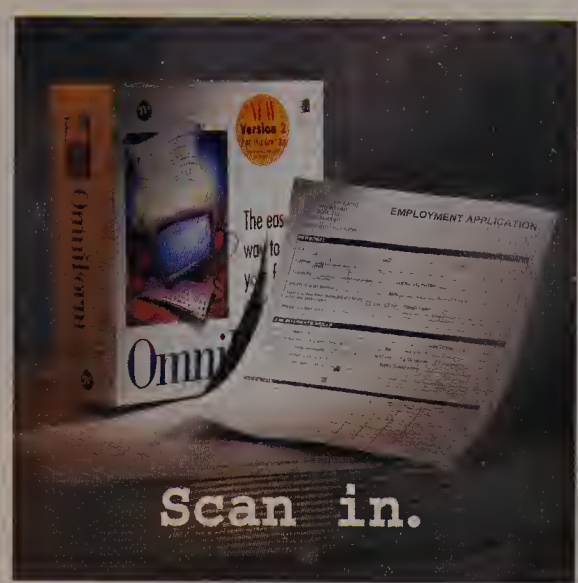
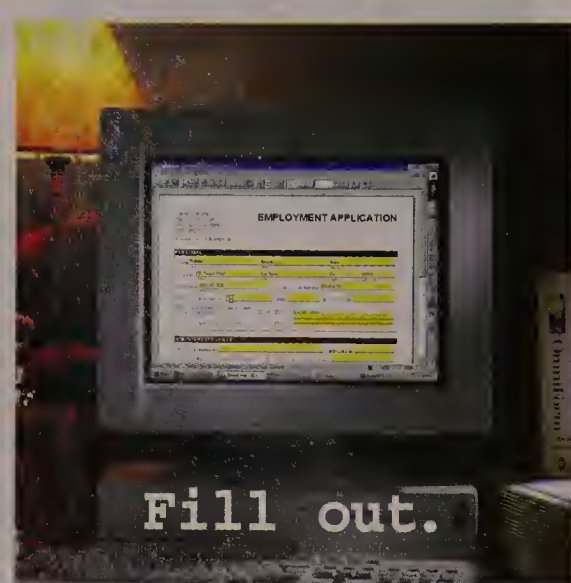


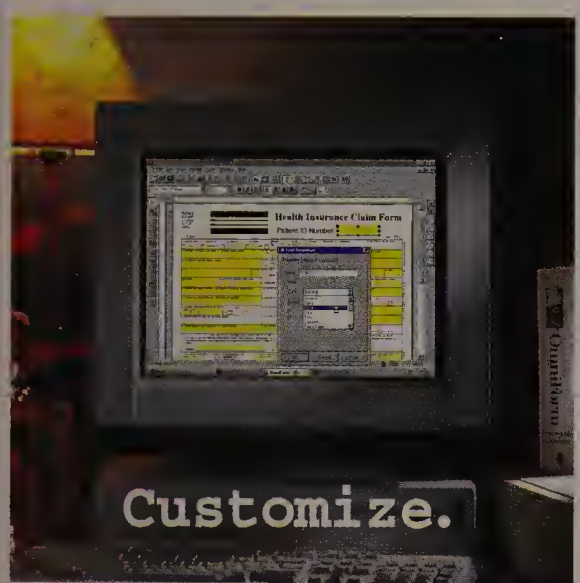
FIGURE 2: SNATCH SNIPPETS OF SOUND from .avi clips using the VidEdit utility.

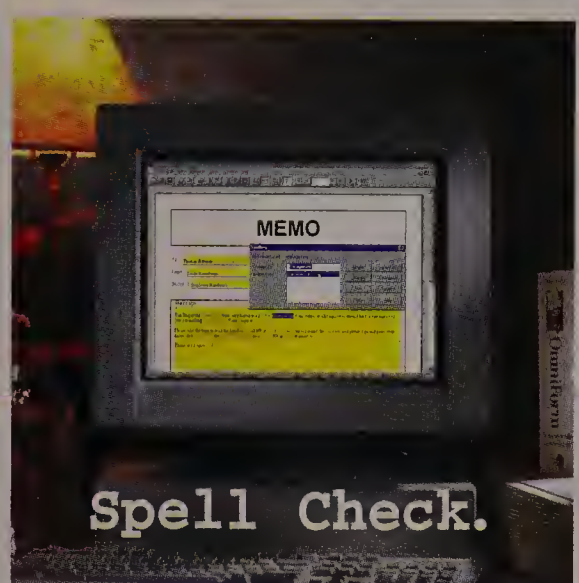
To see the new sound file in Windows 95's Control Panel Sound applet's default list, save it to the \windows\media directory. Select *File•Insert* to add audio to .avi clips, but note that the new material will replace the existing soundtrack in the area selected by *Mark In* and *Mark Out*. To mix new and existing audio, first extract the soundtrack, use Windows' Sound Recorder's *Edit•Mix with File* command to blend new audio with old, then insert the new soundtrack into the .avi clip. ■

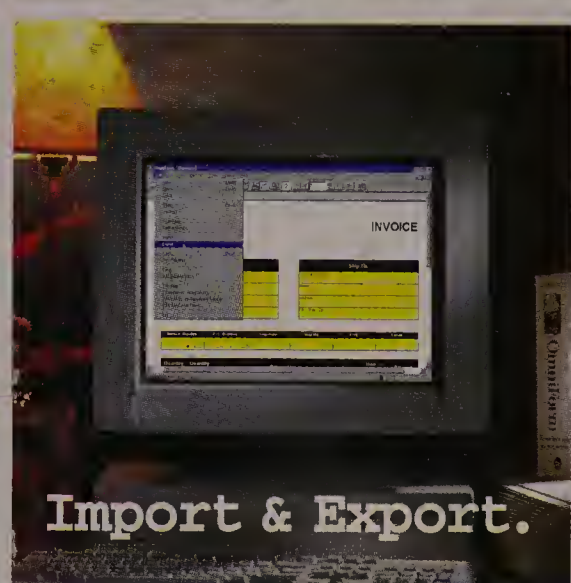
Scott Spanbauer is a PC World *contributing editor.* Multimedia Tips *welcomes your questions and tips and pays $50 for published items. See page 12 for contact information.*

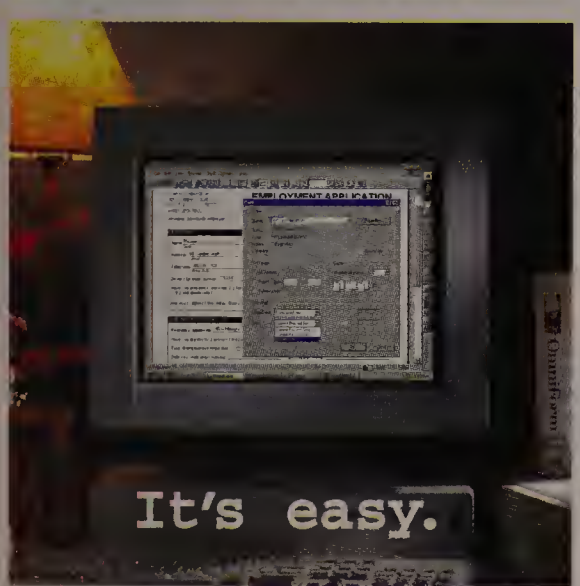


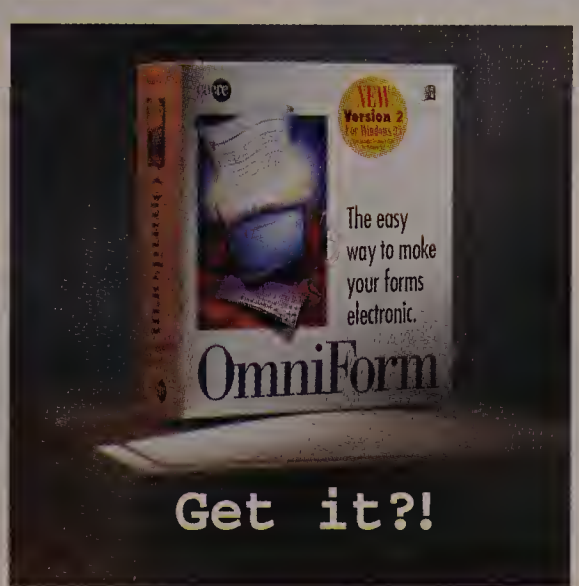












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Installing an Internal CD-ROM Drive

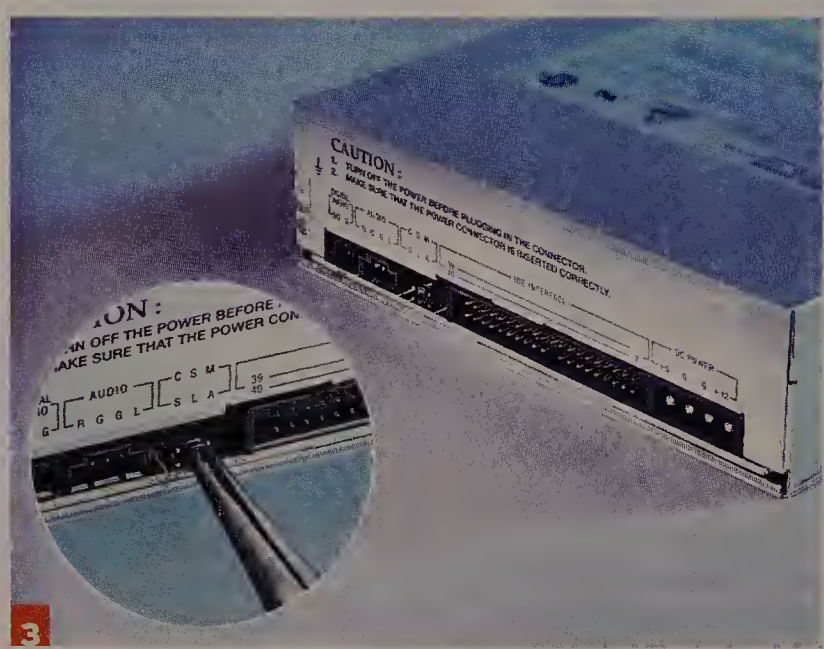
CD-ROM drives are becoming as essential as floppy drives for virtually all PCs. Even if you skip all those eye-popping games, it's getting harder to find applications on floppies. Today you can buy 4X CD-ROM drives for as little as $70, and 6X, 8X, and even 10X drives are available at better-than-reasonable prices.

You don't need to be a rocket scientist to add one of the current crop of internal CD-ROM drives, whether you choose an Enhanced IDE or a SCSI model. Pictured here are steps for installing a new EIDE CD-ROM drive. Check PC World Online (http://www.pcworld.com/hereshow.html) for more details plus information about adding a SCSI drive and advice on troubleshooting.

Contributing Editor Stan Miastkowski has been covering computers for 18 years.

Get ready. Check to see if your open 5¼-inch drive bay requires special rails to mount drives—systems from Compaq, Dell, and other name-brand vendors might. Back up your hard disk and collect all the tools you'll need—usually a Phillips screwdriver and needle-nose pliers will be sufficient.

Check your connections. If your PC is less than two years old, the motherboard probably has two 40-pin EIDE connectors, with one plugged into the hard drive's cable. Don't use that cable for the CD-ROM drive. Use the cable that came with your CD-ROM drive (or buy a cable) and the free EIDE connector. PCs without EIDE connectors need an EIDE card (about $25 if not bundled with the drive).



Show who's master. Check your CD-ROM drive's manual to set the jumpers or switches correctly. It should be master if the CD-ROM drive is the only drive on a cable, as we recommend.

Mount the drive and install the software. Find pin 1 on the EIDE connector. The data cable's red wire (inset) must connect to pin 1. Mount the drive. Connect the data cable, then the 4-wire power cable. If you have a sound card, connect the audio cable to the drive. Install the software that came with the drive, reboot, and put the cover on.

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- Fast system performance with EDO RAM memory

Processor	Screen	RAM/HD	Price
Pentium 75	10.4" Dual Scan	8/504MB	$1799
Pentium 100	11.3" Dual Scan SVGA	8/772MB	2299
Pentium 100	11.3" Active SVGA	8/772MB	2799

Tecra 500
- Pentium 120MHz processor
- Built-in 6X CD-ROM drive (500CDT model only)
- 16MB EDO RAM memory
- 12.1" Super VGA displays

Processor	Screen	RAM/HD	Price
Pentium 120	12.1" Dual Scan SVGA	16MB/1.3GB	$3999
Pentium 120	12.1" Active SVGA	16MB/1.3GB	4999*

* Features 6X CD-ROM drive

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ThinkPad® 365X/XD
- Pentium 100 & 120MHz processors
- Built-in 4X CD-ROM drive (365XD)
- 10.4" & 11.3" SVGA displays
- 32-bit PCI Local bus graphics
- 16-bit sound, speakers and microphone (365XD)
- Infrared port for wireless communications
- External floppy drive (365XD)

Processor	Screen	RAM/HD	Price
Pentium 100	10.4" Dual Scan SVGA	8/810MB	$2499
Pentium 100	11.3" Dual Scan SVGA	8/810MB	2799*
Pentium 100	11.3" Active SVGA	8/810MB	2899
Pentium 120	11.3" Dual Scan SVGA	8MB/1.1GB	3299*
Pentium 120	11.3" Active SVGA	8MB/1.1GB	3699*

* ThinkPad® includes built-in 4X CD-ROM drive

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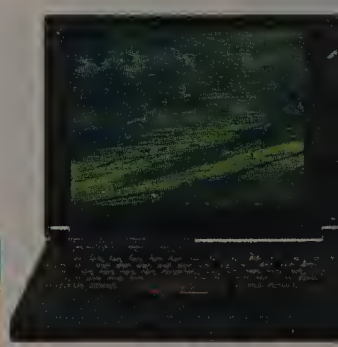
- Built-in 16-bit SoundBlaster compatible audio
- External floppy drive reduces weight
- EDO RAM memory enhances performance
- Infrared transceiver for wireless communication

Processor	Screen	RAM/HD	Price
Pentium 100	11.3" Dual Scan SVGA	8/810MB	$2699
Pentium 120	12.1" Active SVGA	8/810MB	3749
Pentium 133	12.1" Active SVGA	8MB/1.1GB	4199


ThinkPad® 560

NEC

NEC Versa 4000

Processor	Screen	RAM/HD	Price
Pentium 90	10.4" High Res.	8/810MB	$2999
Pentium 90	10.1" Active	8/810MB	3999*
Pentium 120	10.4" High Res.	8MB/1GB	3699

* Features built-in 4X CD-ROM drive

NEC Versa 4000

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NEC Versa 6000
- Up to Pentium 133MHz processors
- Built-in 6X CD-ROM drive
- 2MB video memory
- Built-in 28.8 cellular fax/modem

Processor	Screen	RAM/HD	Price
Pentium 100	12.1" Active SVGA	16MB/1.1GB	$4999
Pentium 133	12.1" Active SVGA	16MB/1.3GB	5799
Pentium 133	12.1" Active SVGA	16MB/1.4GB	6499

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NEC Versa 6000

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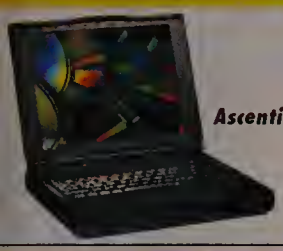
Ascentia P

AST Ascentia P

- Pentium 100MHz and 133MHz processors
- Standard SmartBay – swap 4X CD-ROM, 3.5" floppy or optional 2nd battery
- 11.3" Dual Scan & Active Matrix displays with 800x600 resolution
- 800MB & 1.2GB removable hard drives
- Built-in Soundblaster 16 Vibra chipset

Processor	Screen	RAM/HD	Price
Pentium 100	11.3" Dual Scan SVGA	8/800MB	$3299
Pentium 100	11.3" Dual Scan SVGA	8MB/1.2GB	3779
Pentium 133	11.3" Active SVGA	8/800MB	4249
Pentium 133	11.3" Active SVGA	8MB/1.2GB	4729

AST Ascentia J

- Integrated 14.4/14.4 data/fax modem and audio
- PCI bus architecture with 256KB Level 2 cache
- 10.4" SVGA (800x600) resolution Dual Scan and Active Matrix displays

Processor	Screen	RAM/HD	Price
Pentium 75	10.4" Dual Scan SVGA	8/500MB	$1969
Pentium 75	10.4" Dual Scan SVGA	8/800MB	2159
Pentium 100	10.4" Dual Scan SVGA	8/800MB	2349
Pentium 100	10.4" Active Matrix SVGA	8/800MB	2839
Pentium 133	10.4" Active Matrix SVGA	8/800MB	3299

Ascentia J

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FUJITSU PC Corporation

Monte Carlo

Montego

Processor	Screen	RAM/HD	Price
Pentium 100	10.4" Active SVGA	8MB/1GB	$2999*

* Features 28.8 fax/modem

Monte Carlo

Processor	Screen	RAM/HD	Price
Pentium 100	11.3" Active SVGA	8/810MB	$2999 †
Pentium 100	11.3" Active SVGA	8/810MB	2999
Pentium 100	11.3" Active SVGA	8/810MB	3149 *
Pentium 120	11.3" Active SVGA	16MB/1GB	4199 †
Pentium 120	11.3" Active SVGA	16MB/1GB	4199
Pentium 120	11.3" Active SVGA	16MB/1GB	4349 *
Pentium 133	12.1" Active SVGA	16MB/1GB	4999 †
Pentium 133	12.1" Active SVGA	16MB/1GB	4999
Pentium 133	12.1" Active SVGA	16MB/1GB	5149 *

* Features 28.8 fax/modem
† Features Windows for Workgroups OR Windows 95

Milan

Processor	Screen	RAM/HD	Price
Pentium 100	10.4" Dual Scan SVGA	8/810MB	$1999
Pentium 100	10.4" Dual Scan SVGA	8/810MB	2149 *
Pentium 100	10.4" Active SVGA	8/810MB	2699
Pentium 100	10.4" Active SVGA	8/810MB	2849 *
Pentium 120	11.3" Active SVGA	8MB/1.2GB	3599
Pentium 120	11.3" Active SVGA	8MB/1.2GB	3749 *
Pentium 133	11.3" Active SVGA	16MB/1.2GB	4299
Pentium 133	11.3" Active SVGA	16MB/1.2GB	4449 *

* Features 28.8 fax/modem

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Hitachi C™ Series

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- 5-year warranty

Processor	Screen	RAM/HD	Price
Pentium 100	10.4" Active SVGA	8/720MB	$3199
Pentium 100	10.4" Active SVGA	8/720MB	3199 *
Pentium 120	11.8" Active SVGA	8MB/1GB	4159
Pentium 120	11.8" Active SVGA	8MB/1GB	4159 *

* Features Windows for Workgroups

Hitachi M™ Series

- Integrated 10 Base-T Ethernet card
- Built-in 28.8 data/fax/modem
- SoundBlaster Pro compatible audio
- Built-in 4X and 6X CD-ROM drives

Processor	Screen	RAM/HD	Price
Pentium 100	10.4" Active SVGA	8/720MB	$3499
Pentium 100	10.4" Active SVGA	8/720MB	3499 *
Pentium 120	11.8" Active SVGA	16MB/1GB	4999
Pentium 120	11.8" Active SVGA	16MB/1GB	4999 *
Pentium 133	11.8" Active SVGA	16MB/1GB	5499
Pentium 133	11.8" Active SVGA	16MB/1GB	5499 *

* Features Windows for Workgroups

Hitachi M™ Series Notebook

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- 32-bit PCI Local bus graphics
- Built-in 16-bit SoundBlaster compatible sound, microphone & 2 speakers (selected models)

Processor	Screen	RAM/HD	Price
Pentium 100	11.3" Dual Scan SVGA	8/515MB	$2099
Pentium 100	11.3" Dual Scan SVGA	16MB/1GB	2699*
Pentium 100	11.3" Dual Scan SVGA	8MB/1GB	2999*††
Pentium 120	11.3" Active SVGA	8MB/1GB	3869*†
Pentium 120	11.3" Active SVGA	8MB/1GB	3999*††
Pentium 133	12.1" Active SVGA (SHA)	16MB/1GB	5699*†

* Includes built-in sound system
† Includes built-in 4X CD-ROM drive
†† Includes built-in 6X CD-ROM drive

Built-In CD-ROM
On selected models

Sharp PC Series

TEXAS INSTRUMENTS

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TravelMate 6000

Processor	Screen	RAM/HD	Price
Pentium 120	11.3" Active SVGA	8MB/1.08GB	$4099
Pentium 133	12.1" Active SVGA	16MB/1.35GB	4889

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- Integrated 3-D surround sound (selected models)
- 64-Bit PCI Local bus graphics
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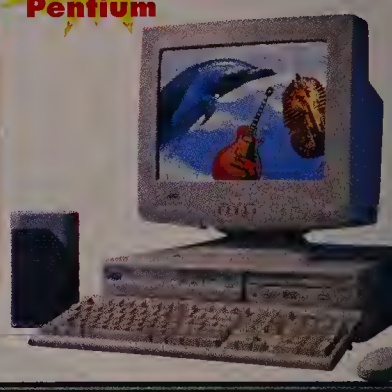
- Enhanced IDE interface-fast disk performance
- AST Lifeline technical support

Processor	RAM/HD	CD-ROM	Price
Pentium 133	8MB/1.2GB	6X	$1539
Pentium 133	8MB/1.2GB	6X	1729
Pentium 133	16MB/1.2GB	6X	1699
Pentium 133	16MB/1.6GB	6X	1819
Pentium 150	16MB/1.6GB	6X	1859
Pentium 150	16MB/2.1GB	6X†	2119
Pentium 166	16MB/2.1GB	6X†	2259

† with 3 disc CD changer
Monitors priced separately

UP TO 166MHz Pentium



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3-D Surround Sound

8X CD-ROM

FULL-MOTION VIDEO

Processor	RAM/HD	CD-ROM	Price
Pentium 120	16MB/1.6GB	8X	$ 2149
Pentium 133	16MB/1.6GB	8X	2399
Pentium 166	16MB/2.0GB	8X	2799
Pentium 200	16MB/2.5GB	8X	3099
Pentium 200	32MB/3.2GB	8X	3499

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UP TO 200MHz PENTIUM

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- 32-bit PCI controller for fast disk performance
- LOADS of FREE software
*4X CD-ROM on 7610

Processor	RAM/HD	CD-ROM	Price
Pentium 120	8MB/1.2GB	4X	$1560
Pentium 120	16MB/1.6GB	6X	1850
Pentium 133	8MB/1.2GB	6X	1750
Pentium 133	16MB/1.6GB	6X	2050
Pentium 150	8MB/1.2GB	6X	1950
Pentium 150	16MB/2GB	6X	2340
Pentium 166	16MB/2GB	6X	2630

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UP TO 166 MHz PENTIUM

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- 1280 x 1024 video resolution

UP TO 166MHz

Processor	RAM/HD	CD-ROM	Price
Pentium 133	16MB/1.6GB	6X	$1899
Pentium 166	16MB/2.5GB	6X	2369

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6X CD-ROM

Presario Multimedia PC

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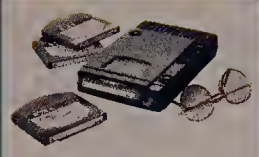

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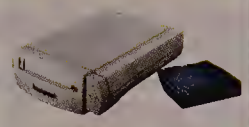

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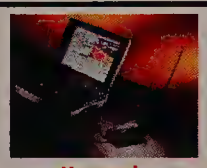
Philips 8X CD-ROM Drive #PCA-80SC/12 — $299.00



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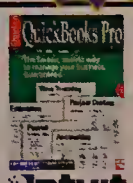

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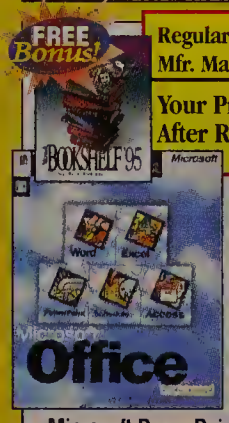

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34184	PLATINUM 40 P133 16MB/1.2GB 8X CD MT	$1,799.00
34185	PLATINUM 60 P166 16MB/1.6GB 8X CD MT	$2,199.00
34186	PLATINUM 70 P200 24MB/2.0GB 8X CD MT	$2,599.00

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33565	Advantage 823 P133 8/1.6GBHD 6CD MT	$1,849.00
33566	Advantage 824 P133 16/1.6GBHD 6CD MT	$1,899.00
33567	Advantage 826 P150 16/2.1GBHD 6CD MT	$2,349.00
33568	Advantage 828 P166 16/2.1GBHD 6CD MT	$2,449.00

NOTEBOOKS

IBM Thinkpad 560

33175	P100 8MB/810HD 11.3" DSCAN Win95	$2,699.00
33177	P120 8M8/810HD 12.1" SVGA TFT Win95	$3,749.00
33173	P133 8MB/1.08GBHD 12.1" SVGA TFT Win95	$4,199.00

Texas Instruments

32184	TM5300 P133 8/1.2GBHD 11.3" SVGA TFT	$3,889.00
32193	TM5200 P120 8/1.2GBHD 11.3" SVGA TFT	$3,399.00
30707	Extensa 560CDT P75 8/1.2 4xCD 10.4 Active	$2,929.00
33582	Extensa 570CD P100 8/810HD 6CD DSCAN	$2,929.00
33583	Extensa 570CDT P100 8/1.2GBHD 6CD TFT	$3,899.00

Hitachi

34804	M100T P100 8/720HD 4CD 10.4" TFT Win95	$3,759.00
34806	M120T P120 16/16GHD 4CD 11.8" TFT Win95	$5,299.00
34808	M133T P133 16/1GBHD 6CD 11.8" TFT Win95	$5,499.00
34810	C100T P100 8/720HD 10.4" SVGA TFT Win95	$3,374.00
34812	C120T P120 8/1GBHD 11.8" SVGA TFT Win95	$4,569.00

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33150	Ascentia P30 P100 8/800HD 4CD 11.3" DS	$3,288.00
33151	Ascentia P30 P100 8/1.2GBHD 4CD 11.3" DS	$3,753.00
33152	Ascentia P50 P133 8/800HD 4CO 11.3" TFT	$4,220.00
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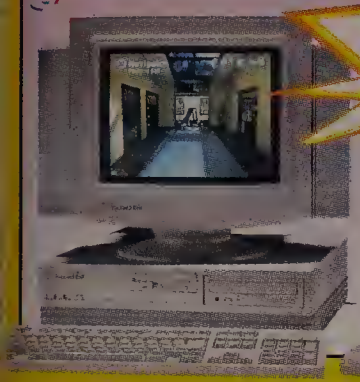

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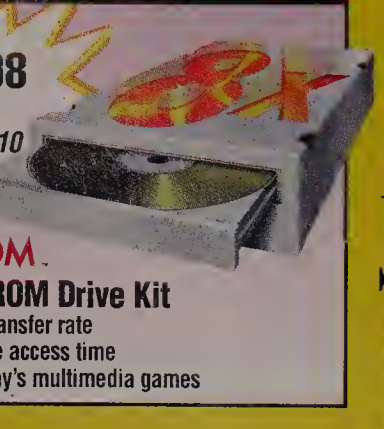

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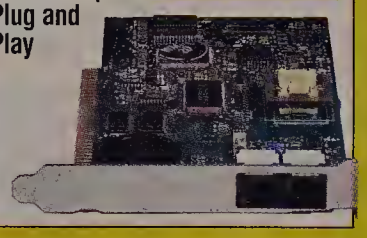

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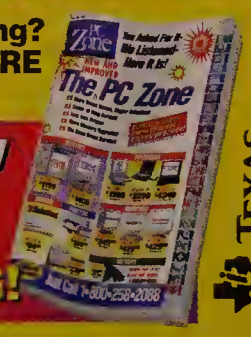

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	16Meg	500987-004	139.00
	32Meg	500987-005	278.00
Premmia LX P/60, MX4/66d, 4/100T, P/6D	8 Meg	500987-003	78.00
	16 Meg	501340-002	180.00
	32 Meg	500987-005	278.00
	64 Meg	501569-001	649.00
Premmia 4133, 4133S, 4/50d, 4/60d	8 Meg	501159-002	89.00
Premmia SE 4/33, 4/66d, P/60	16 Meg	501159-003	149.00
Premmia MTE 4/33, 4/66d, P/60	32 Meg	501159-004	329.00
Manhattan G, V Series Server	64 Meg	501159-005	859.00
Power Premium 3/33, 4/33, 4/33S, 4/50d, 4/66d; Premium 486/25, 486/25E, 486/33, 486/33E; Premium 386/33TE, 486/25TE, 486/33TE; Prem. II 386/25, 386/33, 486/33, 486 SX/20	8Meg	500780-001	168.00
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6450608 (2Meg)	70-A21, A-61, 8-21, 8-61, 35SX, 35LS, 40SX, Val Pt. 325T	29.00
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Tecra 700, 710, 720	*810Meg/1.3Gig*		*729/819*
T2000SXE/2200SX/T1800, 1850, C	2Meg/4Meg/8Meg	PC-PA2000U	69/99/179
T2100, 2105, 2150, 2155, 2110, 2115	4Meg/8Meg/16Meg/24 Meg		89/139/279/319
T4500, C, T4600, T4700, T1900, C, T1910, T1950 (3.3 v)	4Meg	PC-PA2012U	89.00
T4500, C, T4600, T4700, T1900, C, T1910, T1950 (3.3 v)	8Meg	PC-PA2013U	149.00
T4500, C, T4600, T4700, T1900, C, T1910, T1950 (3.3 v)	16Meg	PC-PA2014U	279.00
T4700, 4800, 4850 (Hard Drive)	810Meg/1.3 Gig		729/809
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Canon LBP 430	–	–	39	–	–	–	49	–	–	–	–	–
Canon LBP 860, 1260	–	–	–	39	–	–	69	–	–	94	144	309
Canon LBP4, 4Lite, 4plus	–	–	129	179	–	–	–	–	–	–	–	–
Epson 6000, Action Laser	–	–	–	129	–	–	229	–	–	–	–	–
Epson Action Laser 1100, 1600	–	–	69	70	–	–	99	–	–	199	359	–
Epson Action Laser II	–	–	74	–	173	–	–	272	–	–	–	–
Epson 8000, 1800, 4000, 4100, 4300	–	–	89	–	173	–	–	272	–	–	–	–
Epson 1000, 1500, 5000, 5200	–	–	–	89	–	–	178	–	–	–	–	–
HP 2, 2D–	–	–	–	69	–	–	99	–	–	–	–	–
HP 3, 3D, 3P, 2P 2P+	–	–	–	*69*	–	–	*99*	–	–	–	–	–
HP 4, 4M, 4SI, 4SIMX	–	–	–	49	–	–	59	–	–	99	–	–
HP 4P, 4PLUS, 4MPm 1600, 1600CM	–	–	19	29	–	–	49	–	–	89	–	–
HP 4L	–	–	34	–	–	–	–	–	–	–	–	–
HP 3SI	–	–	39	–	–	–	69	–	–	119	–	–
HP 5L	–	–	49	74	–	–	89	–	–	199	–	–
HP 5P, 5MP, 4V, 4MV	–	–	19	39	–	–	49	–	–	89	169	–
HP Design Jet 600, 650, 200	–	–	–	39	–	–	49	–	–	109	179	279
HP Deskjet 500, 500C, 510, 550, 560	–	*34*	–	–	–	–	–	–	–	–	–	–
HP Deskjet 1200C, 1200C/P	–	–	–	39	–	–	49	–	–	109	–	–
HP Paintjet XL300	54	–	–	–	–	–	69	–	–	144	299	–
IBM Laser 4019, 4019E	–	–	–	–	–	139	–	–	–	–	–	–
IBM Laser 4029, 4037	–	–	–	–	–	–	89	–	–	–	–	–
IBM Laser 4039, 4079	–	–	–	*69*	–	–	*119*	–	–	*209*	–	–
Konica LP-3110, 3115	–	–	119	189	239	–	–	–	–	–	–	–
Lexmark Medley 4C, 4x, 4SX	–	–	Call	Call	Call	–	–	–	–	–	–	–
Lexmark, Optra L, LX, R, RX	–	–	–	–	–	–	59	–	–	94	209	429
Lexmark Valuwriter 300,600	–	–	29	39	–	–	89	–	–	–	–	–
Lexmark Winwriter 200, 400, 600	–	–	29	39	–	–	89	–	–	–	–	–
NEC 90, 290	–	–	–	89	–	–	–	–	–	–	–	–
NEC 95, 97	–	–	–	79	–	–	–	–	–	–	–	–
Oki 400	–	–	–	79	–	–	–	–	–	–	–	–
Oki 400E, 400EX, 410E, 410EX	–	–	89	109	169	–	189	–	–	–	–	–
Oki 810E, EX, 600E, EX, 610E, EX	–	–	29	39	–	–	79	–	–	119	179	–
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TI XL/PS17/PS35	–	–	49	–	–	–	–	–	–	–	–	–
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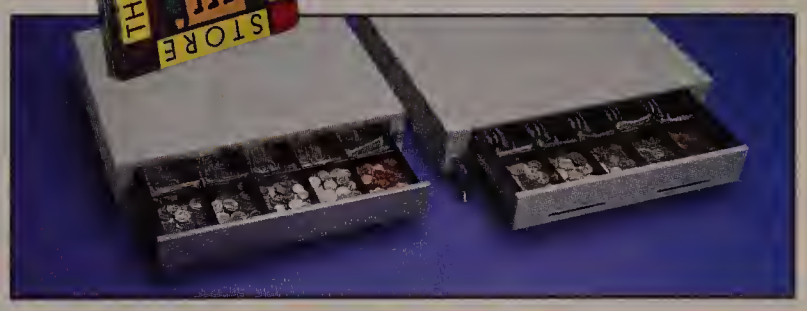

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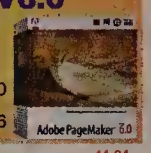

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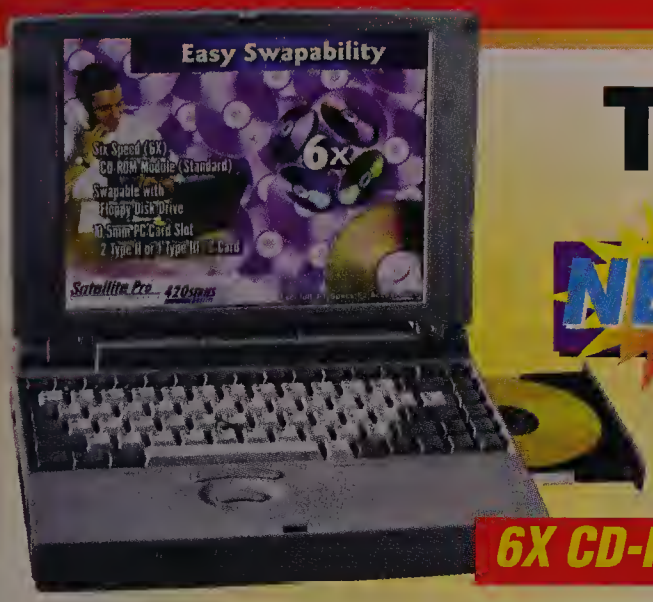

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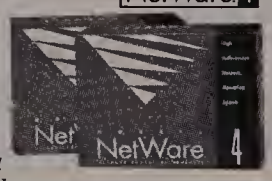

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ATI Graphics Pro Turbo ISA 2MB	252.29
ATI Graphics Pro Turbo PCI 2MB	252.29
ATI Graphics Pro Turbo VLB 2MB	219.02
ATI Graphics Pro Turbo PCI 4MB	393.61
ATI Video Xpression PCI 2MB	152.62
Diamond Stealth64 Graphics 2120 PCI 1MB	91.36
Diamond Stealth64 Video 3240XL PCI 2MB	268.42
Intel Smart Video Recorder Pro	402.82
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Matrox Millennium PCI 4MB WRAM	377.00
Matrox Mystique PCI 2MB WRAM	183.01

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MS-T 5133 5/133 16MB 1.2GB	1831.01
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Armada 4120T 5/120 16MB 810MB 11.8" active	3744.82
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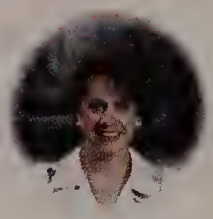

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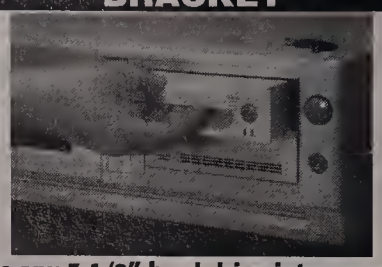

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• SCSI DRIVES •

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Sony	CDU76S	4X	250ms	$119	$209
Pioneer	DRU124X	4.4X	140ms	$109	$199
Plextor	PX43CE	4.5X	130ms	$239	$329
Teac	CD56S	6X	160ms	$219	$309
Plextor	PX63CS	6X	145ms	$279	$369
Philips	PC80S	8X	195ms	$229	$319
NEC	CDR1410	8X	145ms	$259	$349
Toshiba	XM5601B	8X	145ms	$269	$359
Plextor	PX83CS	8X	115ms	$389	$479

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Mitsumi	CRMCFX800	8X	150ms	$125	$140
Teac	CD58E	8X	110ms	$125	$140
Toshiba	XM5602B	8X	145ms	$129	$160
Sony	CDU311	8X	160ms	$129	$160
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NEC	CDR4X4	4	4X	250ms	$179
External SCSI					
Pioneer	DRM-624X	6	4.4X	190ms	$299
Pioneer	DRM-1804X	18	4X	300ms	$1899

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6X	150ms	NEC	$1559	$2629
6X	145ms	Plextor	$1699	$2899
8X	195ms	Philips	$1459	$2499
8X	145ms	NEC	$1559	$2629
8X	145ms	Toshiba	$1999	$3449
8X	115ms	Plextor	$2299	$3999

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6X [SSSPP6XCD]	$229	10X [SSSPP10XCD]	$489

SCSI HARD DRIVES

SCSI	Speed	RPM	Brand	Model	Price
1050MB	9ms	5400	Seagate	ST31055N	$339
1080MB	11ms	5400	Seagate	ST51080N	$249
2050MB	8.5ms	7200	Micropolis	MC4221	$544
2050MB	8.5ms	7200	Micropolis	MC4221AV	$600
2147MB	9ms	5400	Micropolis	MC4421	$399
2147MB	9ms	5400	Seagate	ST32155N	$509
2147MB	8ms	7200	Seagate	ST32550N	$729
4290MB	8ms	7200	Seagate	ST15150N	$989
4290MB	9ms	5400	Seagate	ST15230N	$899
4294MB	8.9ms	7200	Micropolis	MC3243	$799
4294MB	8.9ms	7200	Micropolis	MC3243AV	$889
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2GB	Seagate C4320RT	$599
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2-4GB	Hewlett Packard C1536	$699
4-8GB	Seagate C4326NP (DDS2)	$859
4-8GB	Hewlett Packard C1533A	$879
24-48GB	HP External 6 tape loader C1553AX	$2379
	• 8mm DAT DRIVES •	
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7-14GB	Exabyte EXB8700LT	$1149
	• QIC •	
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1084MB	14ms	4480	Maxtor	M71084A	$195
1090MB	11ms	4500	Fujitsu	M1614T	$165
1250MB	15ms	3600	Quantum	BF1250A	$185
1280MB	12ms	5400	Quantum	FB1280A	$215
1280MB	10ms	5200	Western Digital	AC21200A	$192
1282MB	10.5ms	5400	Seagate	ST51270A	$192
1330MB	12ms	4480	Maxtor	M71336A	$199
1624MB	10ms	5200	Western Digital	AC31600	$229
1625MB	10.5ms	5400	Seagate	ST31640A	$249
1626MB	12ms	4480	Maxtor	M71626AP	$229
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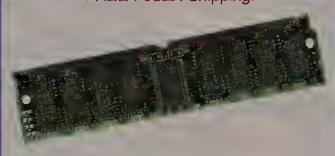

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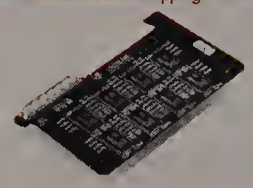

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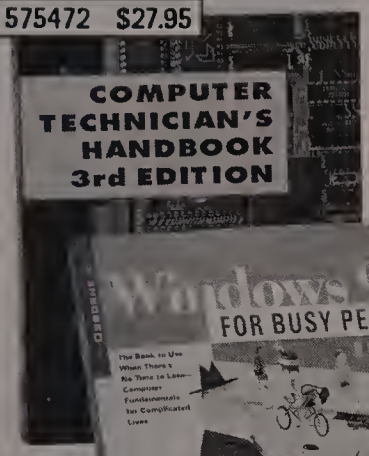

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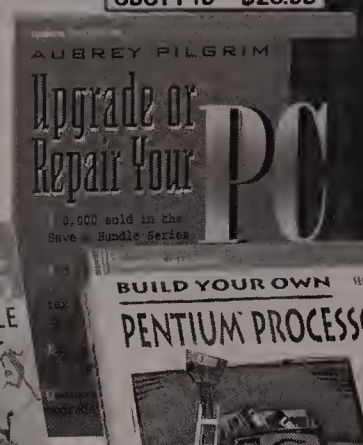

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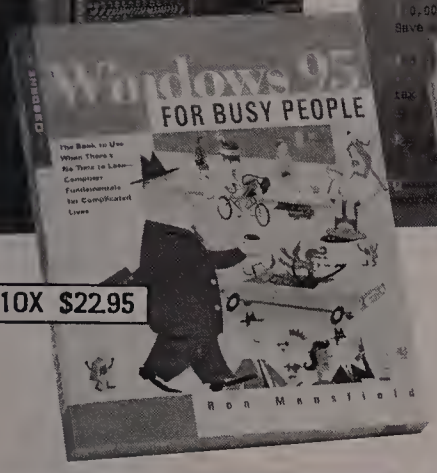

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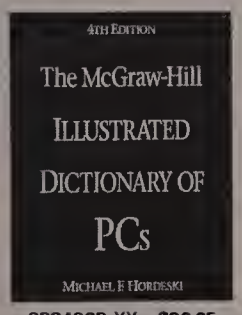

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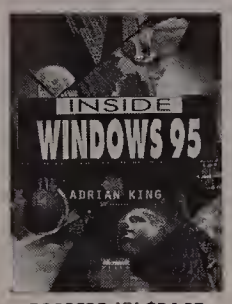

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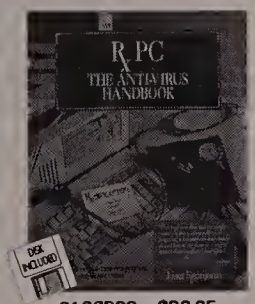

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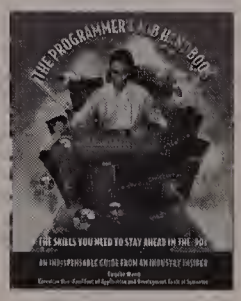

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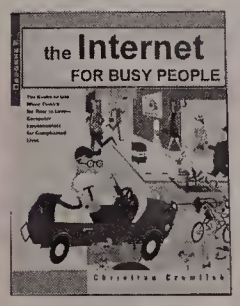

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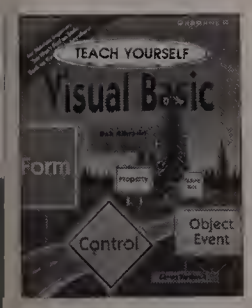

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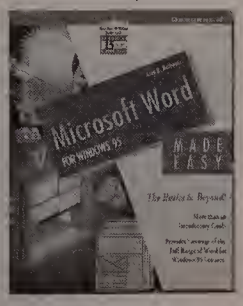

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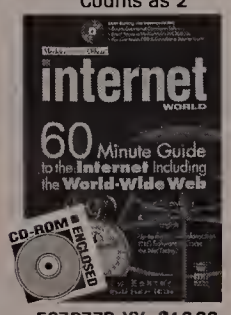

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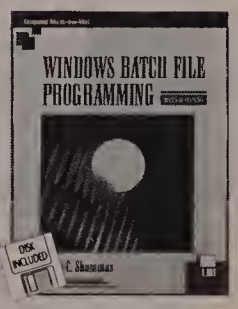

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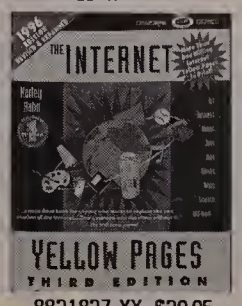

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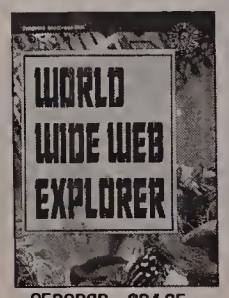

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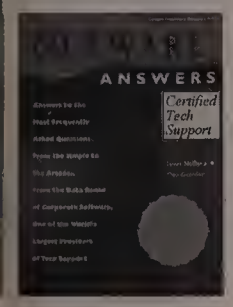

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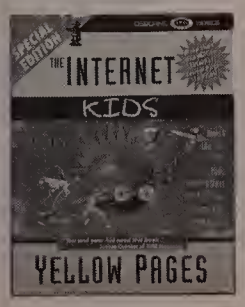

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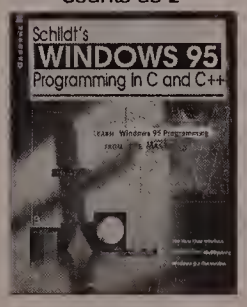

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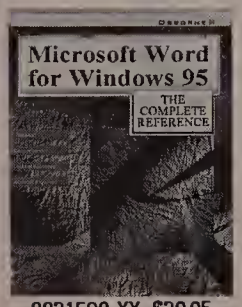

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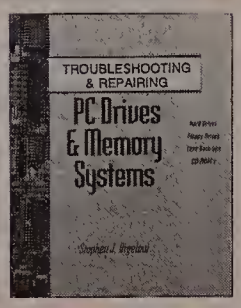

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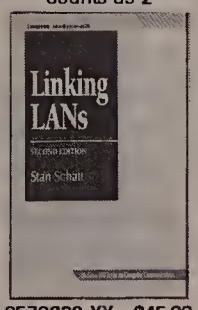

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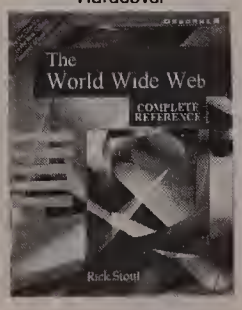

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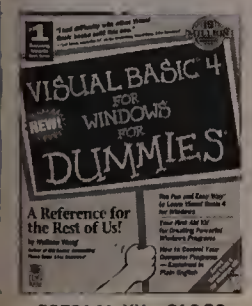

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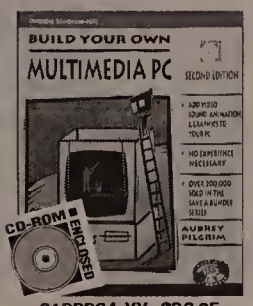

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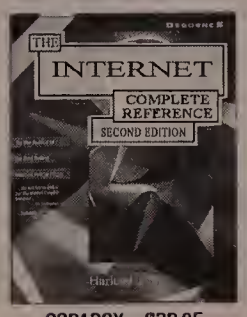

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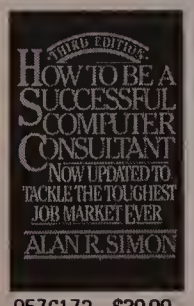

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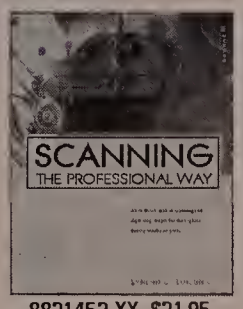

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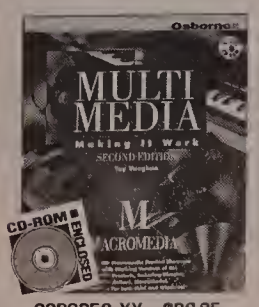

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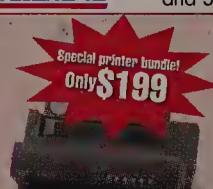

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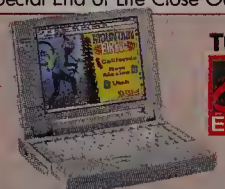

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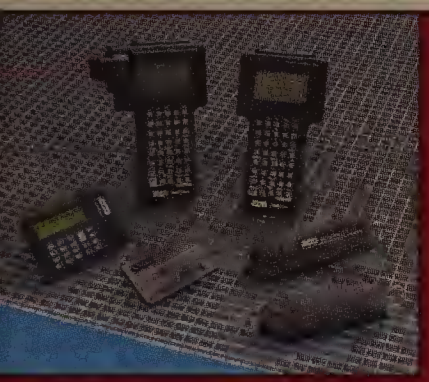

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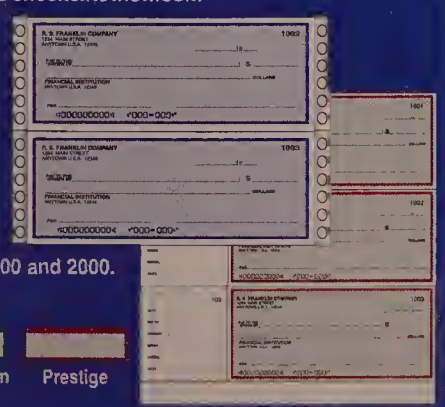

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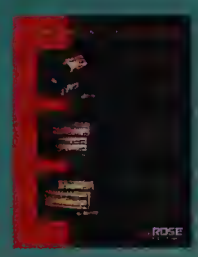

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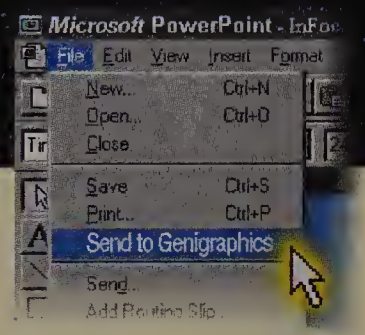

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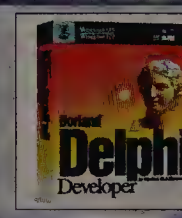
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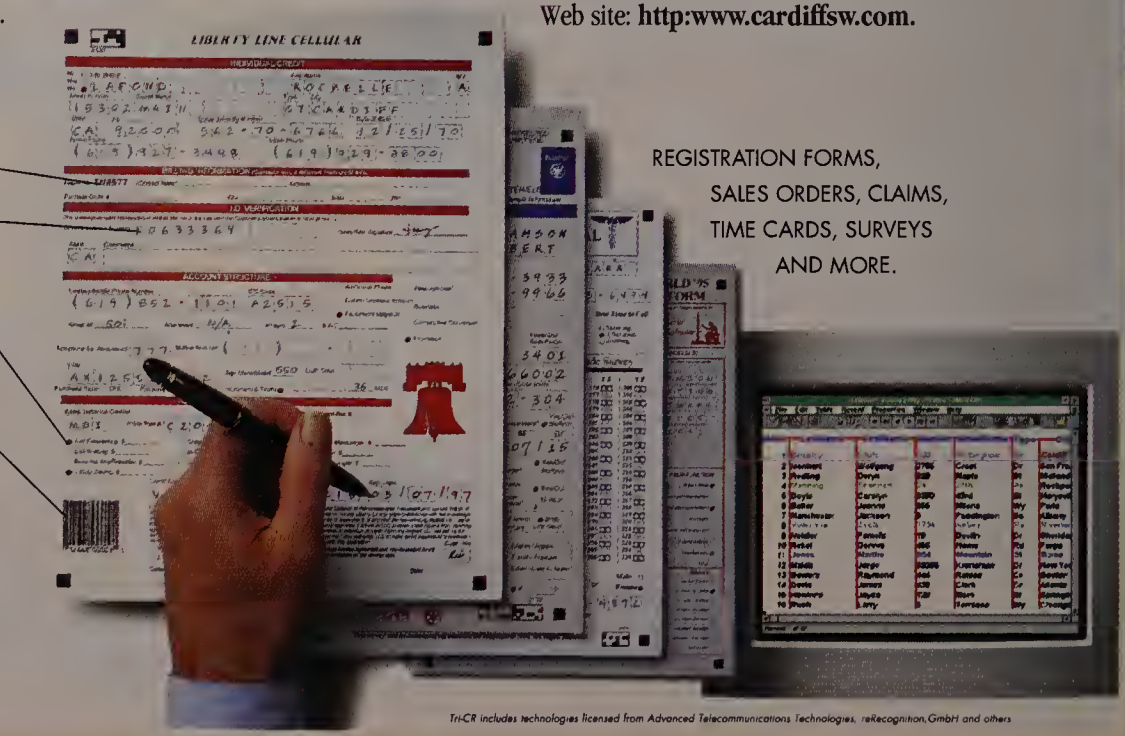

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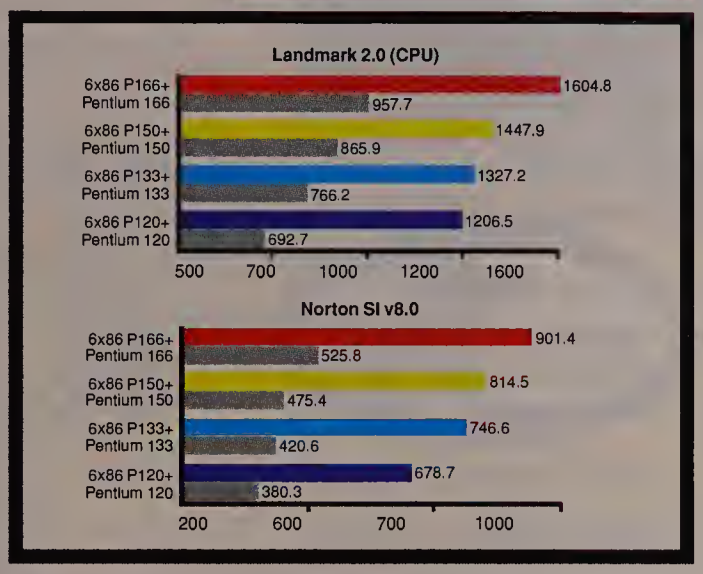

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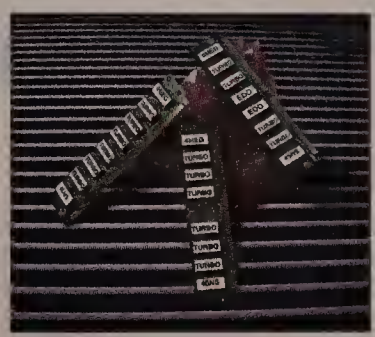

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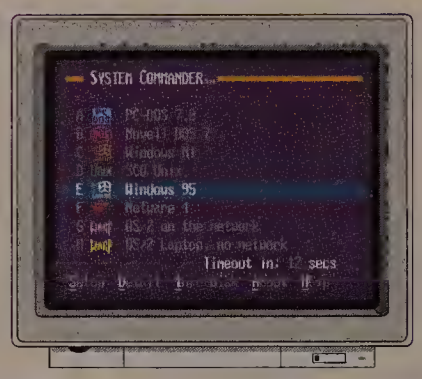

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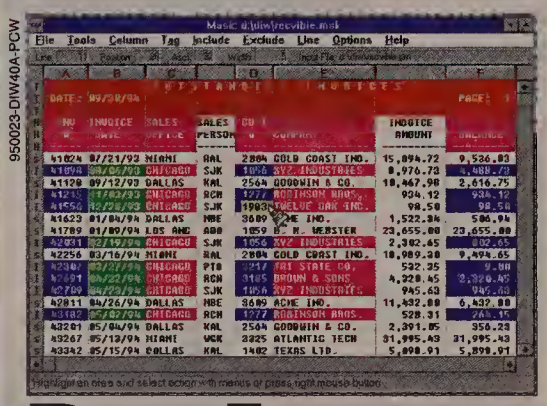

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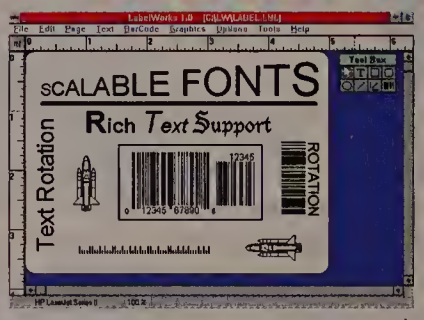

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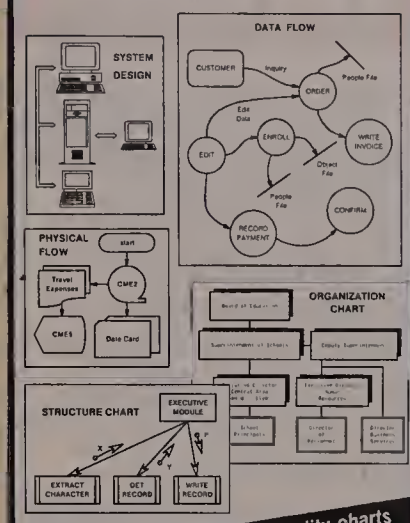

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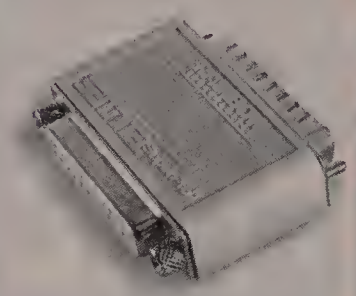

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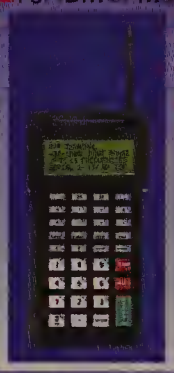

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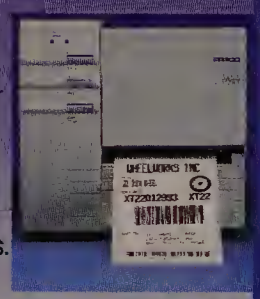

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954 Monitors and video boards
955 Accounting software
956 Graphics software
957 Network/sharing products
958 Printers
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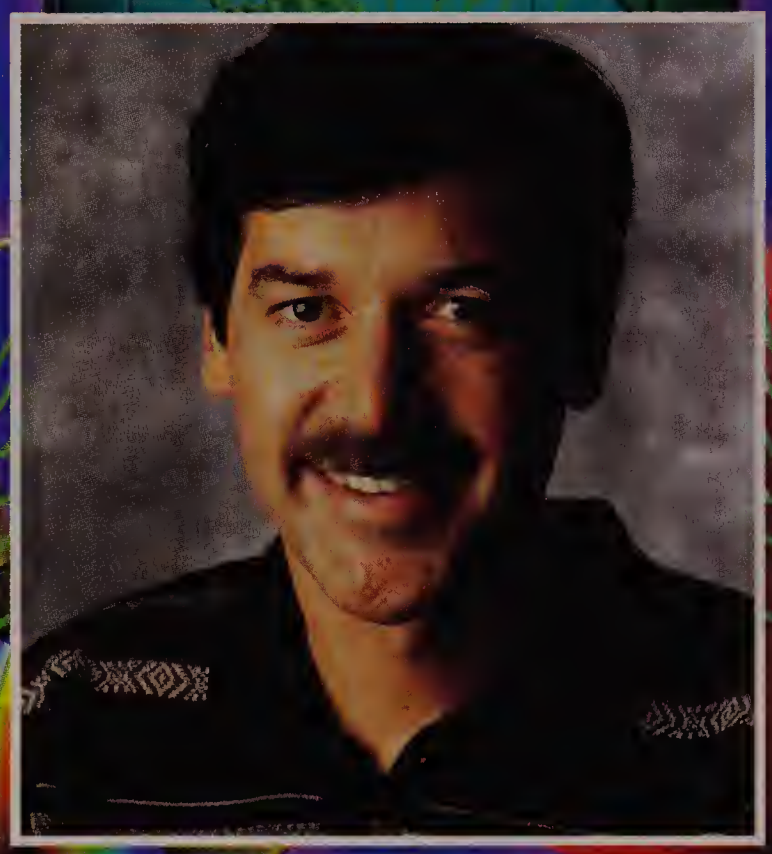

Name: John C. (Bud) Colligan

Company: Macromedia, San Francisco, CA

Title: President and CEO

Bio: John C. (Bud) Colligan leads a team of more than 400 employees developing and marketing some of the leading design tools for multimedia, graphics, video and Web publishing professionals and enthusiasts.

Latest Project: Shockwave—the streaming compression and security technology making it possible to display Director, FreeHand, Authorware, xRes and audio files on the Internet. And Backstage—the easiest way to create multimedia Web pages. Shockwave technology has become the standard for multimedia and graphics on the Internet, with explosive growth in the number of "shocked" sites. Campbell's Soup,Virgin Interactive and Paramount's Mission Impossible are among the thousands of leading Web sites using Shockwave technology.

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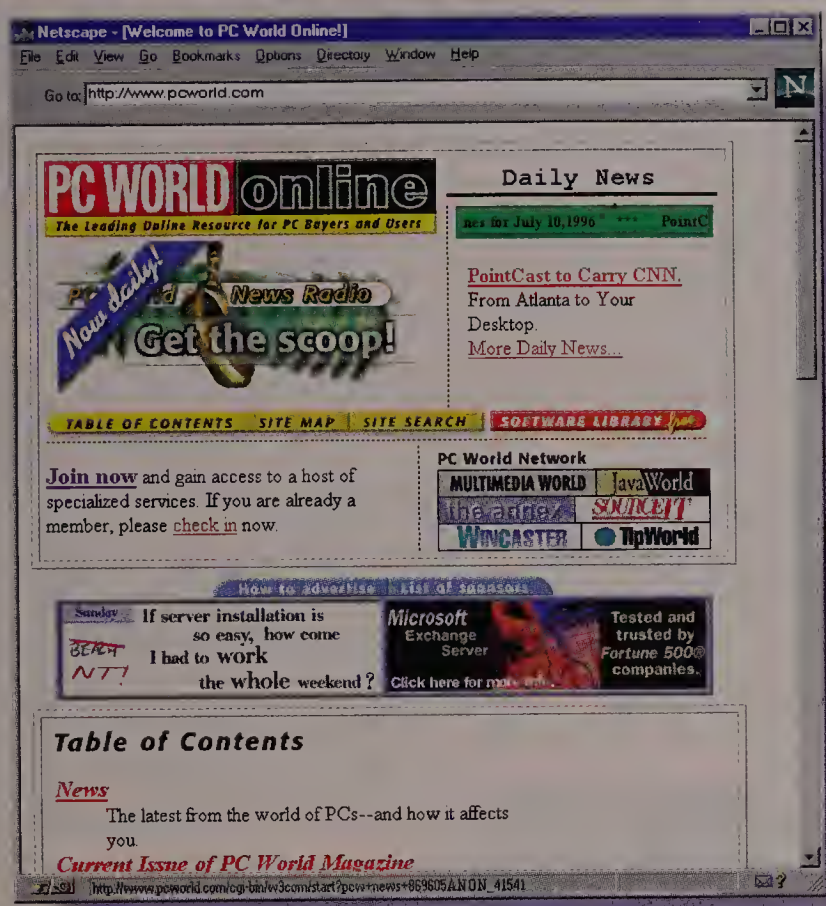

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Registering Software? I Vote No

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Getting customers to **register** products has been a **cat-and-mouse** game since the earliest days of **the PC.**

Think I'm kidding? Caere Corporation's OmniPage Pro for Windows 95 has a policy almost this daffy. The first time you run it, it politely asks you to register. The next 24 times, it nags you about it. That's nothing new: I've run into other programs that keep pestering you until you give in and register. But the 26th time you try to run OmniPage Pro, it won't open until you feed it an official registration number. And once you register, support isn't exactly generous. After your first two calls, you have to pony up $25 per incident, along with any long-distance charges.

Caere is hardly the only culprit. Getting customers to register their hardware and software has been a cat-and-mouse game since the earliest days of the PC. Companies desperately want to know who's buying their products, bribing them with carrots such as sweepstakes or whacking them with sticks like nonsupport. But even when it's as easy as clicking a button on screen, many users forgo the honor of identifying themselves.

And why not? The benefits are almost totally one-sided. The company gets marketing information valuable enough to sell to others; if the registration takes place via modem, the company might be tempted to snoop around the user's machine to find out what else is on it. Users get more electronic junk mail and one more nail in the coffin of their privacy.

If companies really wanted to, they could easily devise better reasons to register products. I routinely send in registration cards for new hardware, on the theory that if the company learns of a potential shock or fire hazard—say, the monitor is likely to burst into flames every time I press <F12>—it might use the information to notify me.

Software's another story. While it might trash your hard drive or infect your system with a nasty virus, it's unlikely to cause you any physical harm. So what would it take to get me to send in the registration card? Well, how about monthly e-mail updates identifying known bugs and the Web locations for the fixes? Useful information would be a more effective way of building a customer relationship.

But it would never end there. The marketers would make sure of that. Just look at the Web. Many sites are downright shameless about asking personal questions before you get access, but at least in that case you haven't already paid for a product. Besides, in these free-market times, using the registration process to help customers rather than turning them into profit centers would be considered an act of altruism unacceptable to the stockholders.

Wait a minute! You still haven't registered this column. Your reading privileges are hereby cut off! Unless, of course, I can interest you in a swell upgrade at a low, low price. Hey, it's got lots of new features. It even corrects some typografical errors. ■

Contributing Editor Stephen Manes is a columnist for the New York Times *and coauthor of* Gates: How Microsoft's Mogul Reinvented an Industry *(Touchstone/Simon & Schuster, 1994, 800/223-2348).*

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